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The Liquor Industry & Industrial Efficiency

Economics

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THE LIQUOR INDUSTRY AND INDUSTRIAL EFFICIENCY

BY

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A. B. Lawrence College, 1912

THESIS

Submitted in Partial Fulfillment of the Requirements for the

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IN

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1913

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I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

Paul Wesley Ivey

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BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE

DEGREE OF Master of Arts

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on
Final Examination

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INTRODUCTION

That a good deal of the literature on the liquor question is of a rhetorical rather than of a scientific order,no one that has studied the subject will deny.Prejudice and antagonism color much of the data,thus discounting a large portion of the subject matter.The results of this fact have no doubt been of a reactionary character;scientific treatment has been discouraged and a complete and accurate knowledge of the question impeded.

Of late years,however,more careful scientific attention has been given to the subject and laboratory experimental methods have entered this field of research.The results of these investigations have oftentimes been productive of irreconcilable and varying data,but this fact may be considered more as a common characteristic of the pioneer application of scientific principles to any new field,rather than as an indication that truth cannot be reached.

Today the modern efficiency movement is making itself felt in all lines of industrial activity.The relation of the liquor industry to this industrial efficiency movement is such that it can hardly be overlooked in a consideration of either question.It is true that conflicting opinions still exist as to the direct bearing of the consumption of alcoholic liquors in moderate quantities on industrial efficiency, yet there is certain intermediate ground where the smoke of conflict has somewhat died away, presenting to view some facts

which may be made the basis for more practical investigations of the future. -

In attempting to apply and interpret many of the circumstances in connection with the liquor industry itself,there is great room for error and misconception.Many problems arise, the answers to which can only be attempted in a limited theoretical way,yet possibly some progress may be made by their bare consideration. At any rate it would seem that if any permanent advance is to made in the consideration of this age-long question, it must be along the scientific lines indicated, rather than by some of the methods of the past.

The present study is an attempt to head in this direction and may be considered only as a temporary statement of some facts as they now exist.As long as new experiments and investigations are constantly being made, there is ever the possibility of new data being found and new conclusions being formed.

PART 1

AN ECONOMIC ANALYSIS OF THE LIQUOR INDUSTRY

I. CLASSIFICATION OF INDUSTRIES

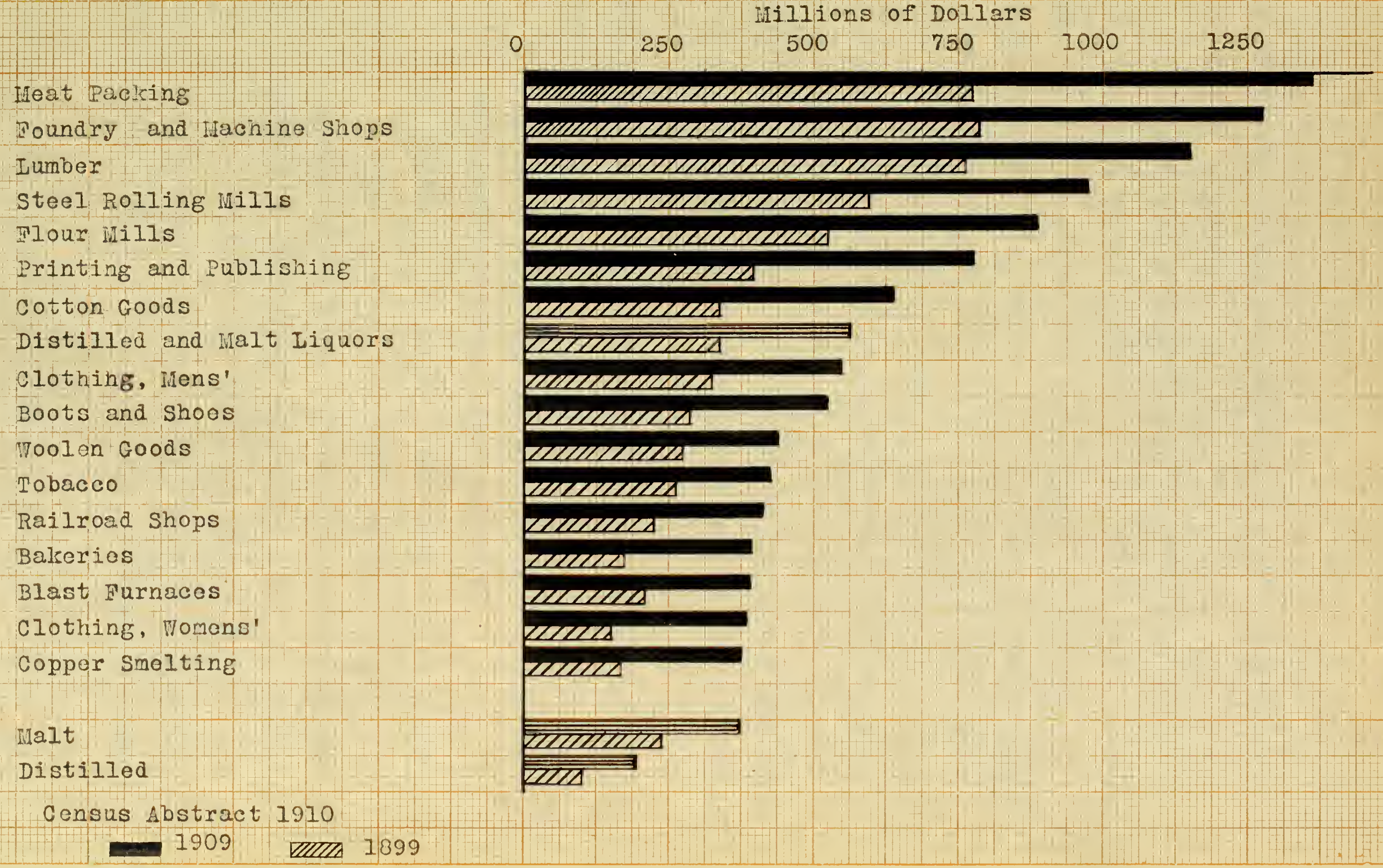
The relative importance of the liquor industry as compared with the other industries of the United States,may be represented in several different ways.According to classification by value of products (plate 1) the malt, distilled and vinous liquor industries taken together, rank eighth among the industries of the United States. Taken separately the malt liquor industry ranks seventeenth, the distilled liquor industry twenty sixth, while the vinous liquor industry ranks among the smallest of the country.

The classification giving value added by manufacture ranks the malt liquor industry fifth, the distilled liquor industry twelfth while the vinous liquor industry ranks low among the smaller industries.

In regard to the method of determination in classifying industries,the Census Department says, "The figures for both value of products and value added my manufacture in the case of the brewery and distillery industries include a very large amount of tax paid to the Federal Government, and are therefore misleading as an indication of the relative importance of these industries from a purely manufacturing standpoint. That importance is best shown by their ranking in number of wage earners; in this respect the brewery industry

Plate I

VALUE OF PRODUCTS, BY INDUSTRIES: 1909 & 1899.



Census Abstract 1910

ranks twenty-fifth among the industries of the country, and the distillery industry forty-third."[1]

The combined liquor industries of the United States employ only nine tenths of one per cent of the total number of wage earners in all of the industries.They buy one and fourteen-hundredths per cent of the raw materials used in all manufacturing processes, pay one and thirty-one hundredths per cent of the total wages paid by all industries, secure for their products two and eighty-nine hundredths per cent of what is secured for all products of manufacture, invest four and sixteen hundredths per cent of the total invested capital of the country, and add by the process of manufacture to their raw materials five and thirty-one per cent of all the value that is added by manufacturing processes in all industries.(plate 2)

II. GROWTH OF THE LIQUOR INDUSTRYS

The growth of the liquor industries has been constant and similar to that of other industries of the country.(table 1) The vinous liquor industry has tripled its capital in the last decade, doubled the output represented by value of products, and the cost of raw materials used, and nearly doubled the number of its wage earners. The distilled liquor industry has shown a similar growth.It has more than doubled its capital,

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[1] Census Abstract of the United States,1910. p,442.

Plate 2

COMPARATIVE SIZE OF THE COMBINED LIQUOR INDUSTRIES AND ALL INDUSTRIES OF THE UNITED STATES

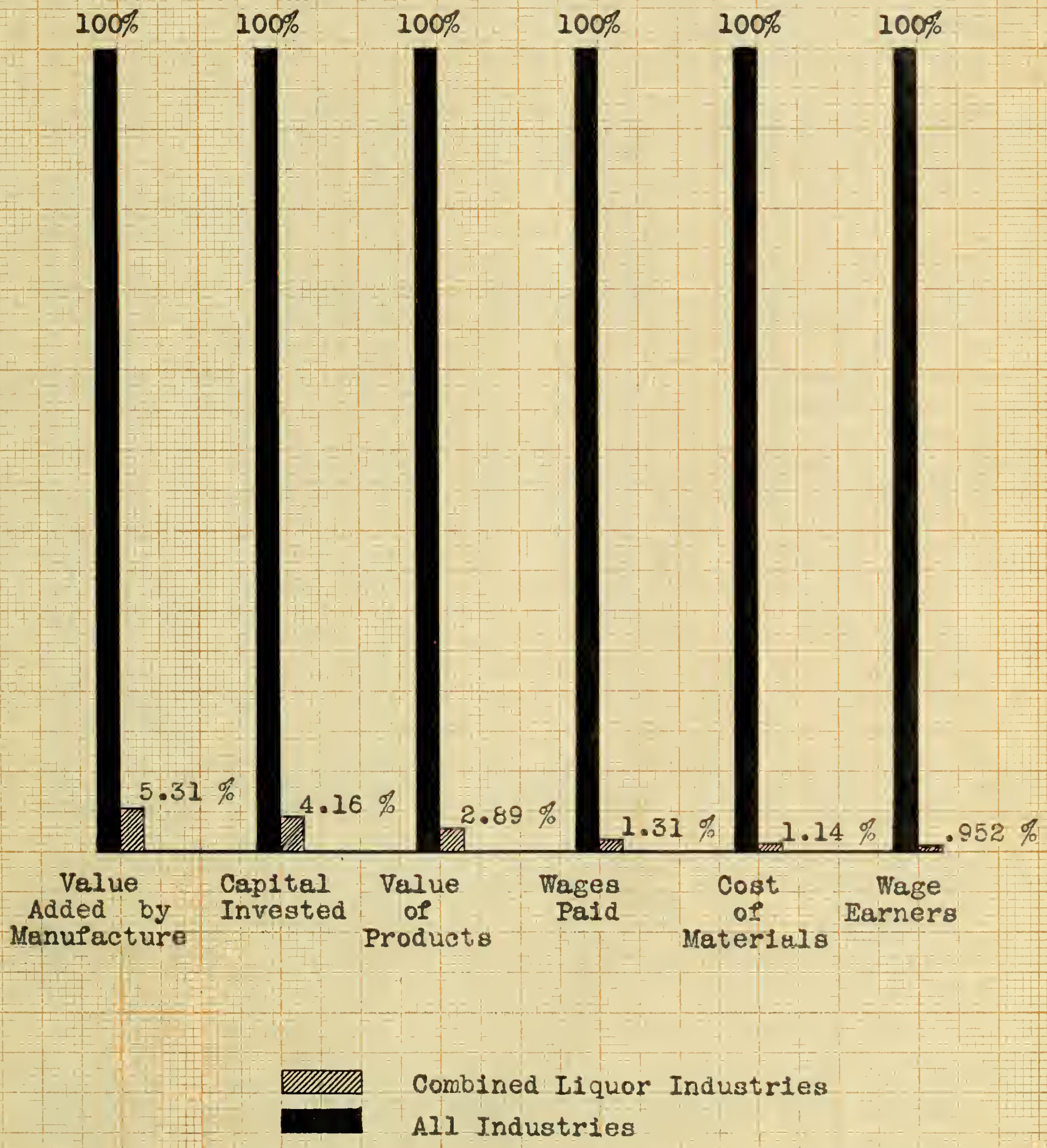


Table 1.

STATISTICS OF LIQUOR MANUFACTURERS

1910 (heavy type); 1900 (light)

	TOTAL	MALT LIQUORS	DISTILLED LIQUORS	VINOUS LIQUORS
Capital	**771,516,000** 457,674,087	**671,158,000** 415,284,468	**72,450,000** 32,284,468	**27,908,000** 9,838,015
Salaried officials & clerks	**13,421** 8,158	**11,507** 7,153	**1,335** 661	**579** 344
Salaries	**25,655,000** 14,306,000	**22,804,000** 13,046,000	**1,988,000** 889,606	**863,000** 365,000
Wage earners, Av. number	**62,920** 44,417	**54,579** 39,532	**6,430** 3,722	**1,911** 1,163
Total Wages	**45,252,000** 28,005,000	**41,206,000** 25,826,000	**3,074,000** 1,733,000	**972,000** 446,000
Men over 16 years	43,107	**52,865** 38,385	**7,008** 3,623	1,099
Women over 16 years	646	**1,040** 504	**1,111** 81	61
Children under 16 years	664	**230** 643	**11** 18	3
Cost of Materials	**139,199,000** 70,512,000	**96,596,000** 51,674,000	**35,977,000** 15,147,000	**6,626,000** 3,689,000
Value of Products	**595,550,000** 340,615,000	**374,730,000** 237,269,000	**204,699,000** 96,798,443	**13,626,000** 6,547,000

Special Report on Manufactures of the United States, 1900.
Census Abstract of the United States, 1910.

its number of wage earners, cost of materials used and its output. Relatively, the malt liquor industry does not show such large development but yet it shows great increases. The capital has increased sixty-two per cent, the wage earners thirty-five per cent, the value of products fifty-one per cent and the cost of raw materials used has nearly doubled.

The relative growth of the three liquor industries in the last decade, has been far greater than the growth of population for the same period.(plate 3) In contrast to the twenty-one per cent increase in population, the malt industry shows a thirty-five per cent increase in wage earners, while the distilled and vinous liquor industries each have an increase of about sixty-five per cent in this respect.

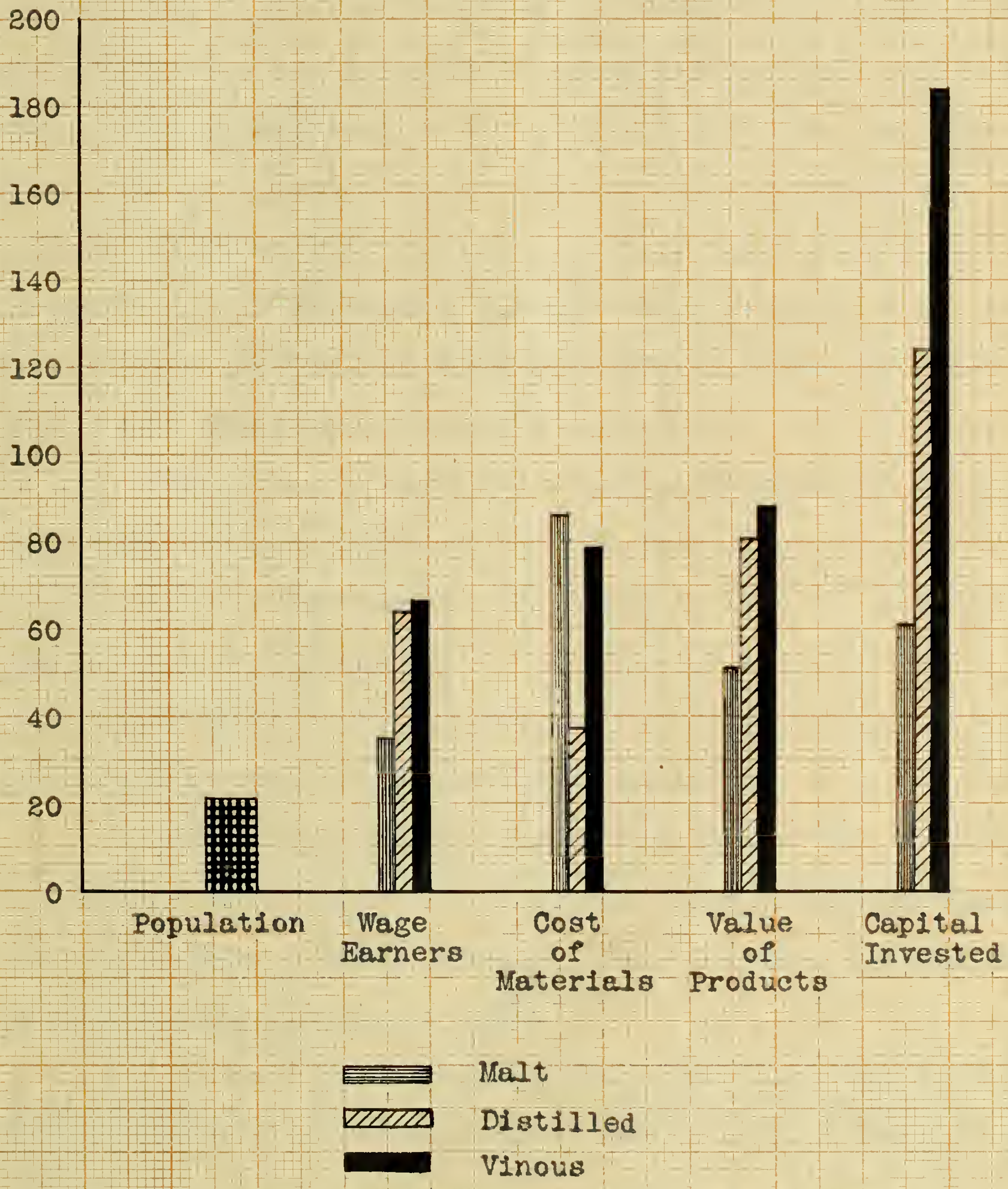
Under classification of cost of materials, the malt liquor industry has an eighty-six per cent increase, the distilled liquor industry a thirty-eight per cent increase and the vinous liquor industry a seventy-nine per cent increase.

According to value of products the malt liquor industry has increased fifty-one per cent and the distilled and vinous liquor industries have increased eighty-one per cent and eighty-seven per cent respectively.

The greatest increase in the distilled and vinous liquor industries is in the capital invested, the increase in the former industry being one hundred and twenty-four per cent and in the latter one hundred and eighty-three per cent. The malt liquor industry shows an increase of about sixty-two per

Plate 3

RELATIVE PER CENT OF GROWTH OF THE COMBINED LIQUOR INDUSTRIES, FROM 1900 - 1910, AS COMPARED WITH THE GROWTH OF POPULATION FOR THE SAME PERIOD



Constructed from statistics in the Census Abstract of the U.S.

cent in capital invested.

Looking at the growth of the liquor industrys from the side of per capita consumption we see a remarkable increase in the consumption of malt liquors and a simultaneous falling off in the use of distilled spirits.(plate 4)

Since 1850 the per capita consumption of distilled spirits has fallen off from two and twenty-four hundredths gallons to one and forty-three hundredths gallons, while the per capita consumption of malt liquors has increased from four and eight hundredths gallons in 1850 to twenty one and eighty-six hundredths gallons in 1910.The per capita consumption of vinous liquors has more than doubled in the last sixty years, having increased from twenty-seven hundredths gallons to sixty-five hundredths gallons.

From 1850 to 1860 there was an increase of malt liquors consumed per capita of one and seven-tenths gallons; 1860 to 1870 an increase of two gallons; 1870 to 1880 one and six-tenths gallons; 1880 to 1890 four and five tenths gallons; 1890 to 1900 four and six-tenths gallons and from 1900 to 1910 five and eight-tenths gallons.

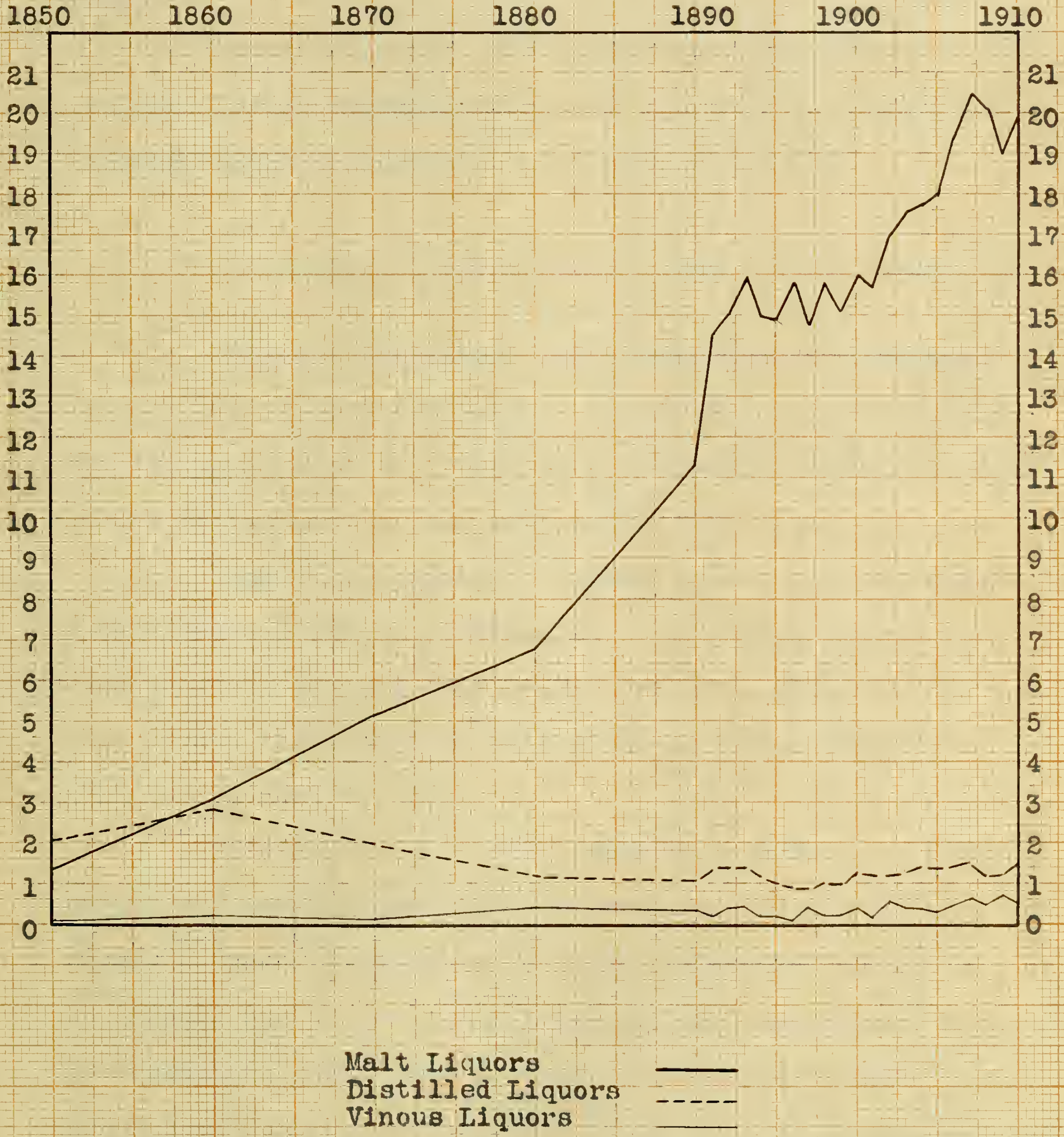
Since 1880 the per capita consumption has increased three times as fast as it did in the three preceeding decades, increasing from seven gallons in 1850 to twenty one and eighty six hundredths gallons in 1910.

In the eleven years 1880 to 1892 there was an extraordinary increase in consumption of seven and nine-tenths gallons

Plate 4

PER CAPITA CONSUMPTION OF ALCOHOLIC LIQUORS IN THE UNITED STATES, 1850 - 1910.

(in gal.)



Constructed from Reports of the Commissioner of Internal Revenue.

per capita, which was greater by almost three gallons than the increase in the thirty years previous. From 1892 to 1902 the per capita consumption was relatively stationary, but increased again from that date up until 1907 when a slight fall took place.

Taken as a whole the period considered shows a steady increase in the consumption of malt and vinous liquors but a decrease in the consumption of distilled spirits.

III.GROWING CONCENTRATION OF THE LIQUOR INDUSTRIES

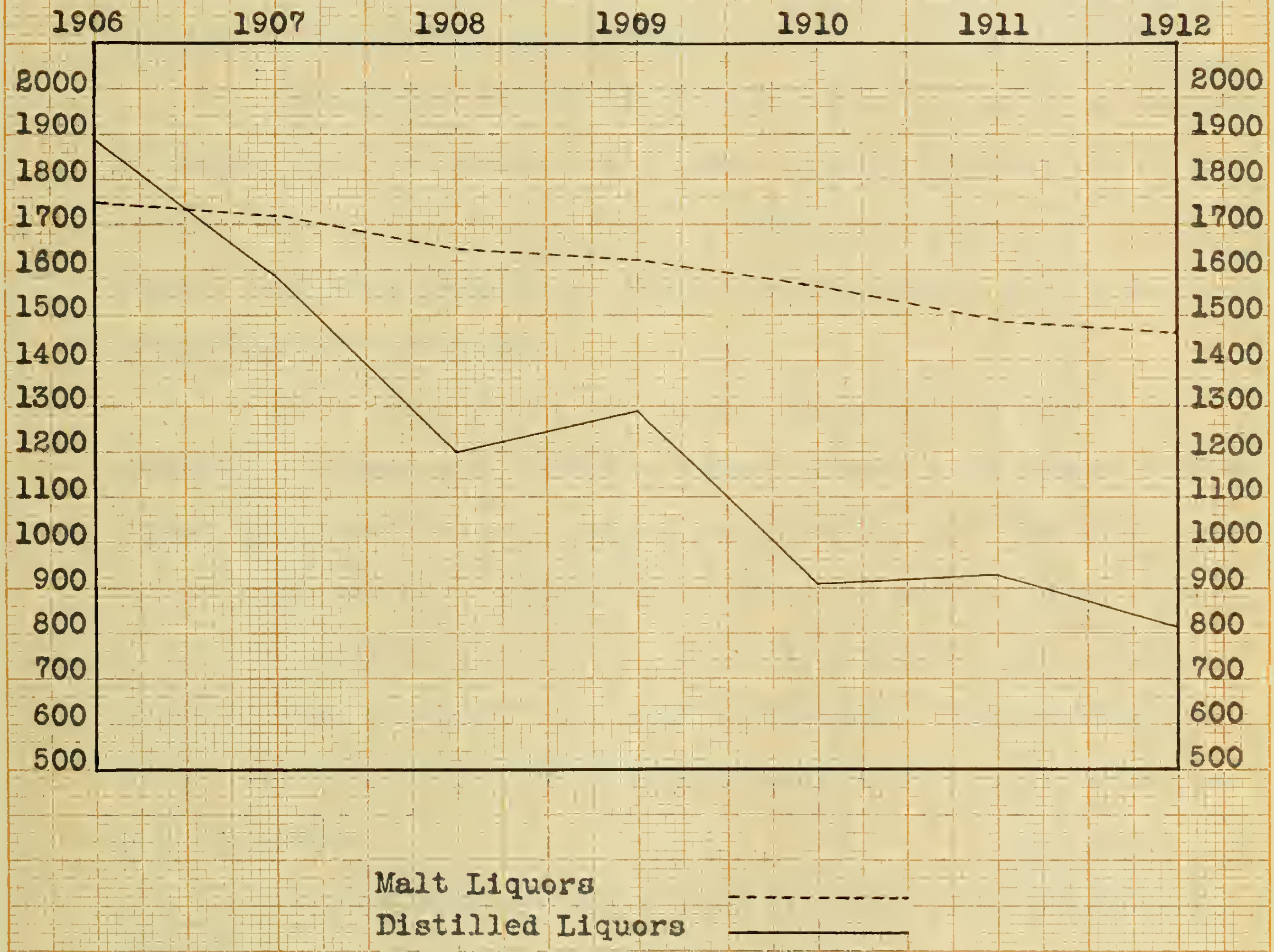
Although the output and consumption of alcoholic liquors has increased greatly, the number of establishments for the production of liquors has noticeably diminished within the latter part of the last decade.(Plate 5)

From June 30 1906 to June 30 1912 the total number of establishments for the production of distilled spirits decreased fifty six and four-tenths per cent, while during the same period the output of this class of liquor increased approximately nine per cent.

This decrease in the number of distilleries is partly due to the prohibitory nature of certain state laws which have closed up the distilleries in their respective states, but it is largely due to the natural tendency at the present time to the combination and concentration of industries. When distilleries have been forced to leave certain states because of re-

Plate 5

DECREASE IN THE TOTAL NUMBER OF ESTABLISHMENTS FOR THE PRODUCTION OF MALT AND DISTILLED LIQUORS, FROM 1906 to 1912



Constructed from the Reports of the Commissioner of Internal Rev

strictive laws, the capital has no doubt in many instances gone to enlarge the productive capacity of those distilleries in the states which permit the manufacture of this product, but many of the small establishments in protected states have enlarged their capacity with their own capital, when the new demand for their products has asserted itself from the states where production of liquors is prohibited.

From June 30 1906 to June 30 1912 the number of establishments for the production of malt liquors decreased by two hundred and eighty-six,or sixteen and three-tenths per cent. During this same period the output of this class of liquors increased fifteen per cent.

This decrease in the number of breweries is due to somewhat the same causes which have produced a decrease in the number of distilleries. Being a larger industry, the operating causes have not made themselves obvious to such a large degree as in the distillery industry, but concentration has taken place to such a degree that half of the malt liquors produced in the United States are brewed in the two cities of Milwaukee and St. Louis.

The decrease in the number of establishments for the production of malt and distilled liquors has been accompanied by a decrease in the number of employees in these two industries.(Table 2)

While there has been a slight increase of one hundred and fifty nine retail dealers in malt liquors from 1906 to

Table 2

DISTRIBUTION OF PERSONS EMPLOYED IN THE LIQUOR INDUSTRIES OF THE UNITED STATES

INDUSTRIES	NUMBER in 1906	NUMBER in 1912	DECREASE	INCREASE
Rectifiers	2,405	2,339	66	
Retail Liquor Dealers	243,400	216,144	27,256	
Wholesale Liquor Dealers	6,311	7,051		740
Manufacturers of Stills	41	23	18	
Brewers	1,747	1,506	241	
Retail Dealers in Malt Liquors	17,094	17,253		159
Wholesale Dealers in Malt Liquors	10,871	12,123		1,252
TOTAL	281,869	256,439	27,581	2,151

Total decrease in the number of persons employed ------25,430

Annual Reports of the Commissioner of Internal Revenue.

1912, this has been offset by a great decrease of twenty seven thousand two hundred and fifty six retail liquor dealers. The number of rectifiers and brewers together have decreased by three hundred and seventeen, while there has been an increase of seven hundred and forty wholesale liquor dealers and one thousand two hundred and fifty two wholesale dealers in malt liquors.

On the whole there has been a total decrease of twenty five thousand four hundred and thirty persons engaged in these two liquor industries within the last six years. This decrease is not due to any great extent to improved machinery as is the case in many modern industries. The decrease is mostly due to prohibitory laws which have forced large numbers of retail liquor dealers out of business.In many cities the number of retail liquor dealers are now limited according to population, while in other cases the license fees have been raised so high that the small dealer has been crowded out.

IV. RAW MATERIALS USED IN THE LIQUOR INDUSTRIES

The quantity of raw materials used in the combined liquor industries is not of great magnitude, compared with the value of their finished products.

The malt and distilled liquor industries use a very small per cent of the total grain crop of the United States. (Table 3)The grains that are used in the greatest amounts are barley and rye. Thirteen and thirty four-hundredths per cent of

Table 3

PER CENT OF THE GRAIN CROP USED IN THE MANUFACTURE OF MALT AND DISTILLED LIQUORS

GRAINS	TOTAL PRODUCTION (bu.)	QUANTITY USED IN MAN'F OF MALT LIQUORS (bu.)	QUANTITY USED IN MAN'F of DISTILLED LIQUORS (bu.)	% OF CROP USED IN MALT LIQUORS	% OF CROP USED IN DISTILLED LIQUORS	% OF TOTAL CROP USED
Oats	1,007,142,980	----------	9,840	------	.0009	.0009
Barley (malt)	173,344,212	12,978,570	1,678	13.34	.0009	13.34
Wheat	683,379,259	----------	9,648	------	.0014	.0014
Corn	2,552,189,630	74,356,395	18,080,711	2.91	.7084	3.6194
Rye	29,520,457	----------	4,364,097	------	14.7	14.7
Hops[2]	40,718,744	entire	----------	entire	-------	entire[3]

Value of all farm products ----------------- $5,487,161,223

Value of all farm products used in the manfacture of Malt and Distilled liquors ------ 75,713,793 [4]

Per cent of total value of farm crop of the United States used in the manufacture of Malt and Distilled liquors ----------------- 1.14

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1. Thirteenth Census Abstract of the United States, p.360 Year Book of the Department of Agriculture, 1910.
2. Specified in terms of pounds.
3. Approximately.
4. Based on the following prices of grains in the Thirteenth United States Census Report:
Price per bu. --- Oats .45; Barley .60; Wheat .99; Corn .80;
Price per lb. --- Hops .22.

the total barley crop is used in making both malt and distilled liquors, while fourteen and seven-tenths per cent of the total rye crop is used in making distilled liquors. A relatively insignificant amount of the oat and wheat crops are used in the production of distilled liquors, while neither of these grains are used in the manufacture of malt liquors. Seventy four million bushels of corn are consumed in the malt liquor industry, and eighteen million in the distilled liquor industry, but these amounts combined are only three and sixty one-hundredths per cent of the total corn crop. Practically the entire hop crop is used in the malt liquor industry.

Thus relatively speaking, not a great amount of farm products are used in the production of malt and distilled liquors.The amount of fruits consumed in the process of distilling spirits is small compared even with the amount of grain used for the same purpose.[1] Little molasses is used in the liquor industries, being used only in the manufacture of rum.

The amount of wine produced is small (Table 1) and the land devoted to vineyards is only a fractional part of a per cent of the total agricultural land area.

V. ANALYSIS OF THE LIQUOR PRODUCTS VALUE

In most industries where a small per cent of the products value is given for raw materials, a corresponding larger

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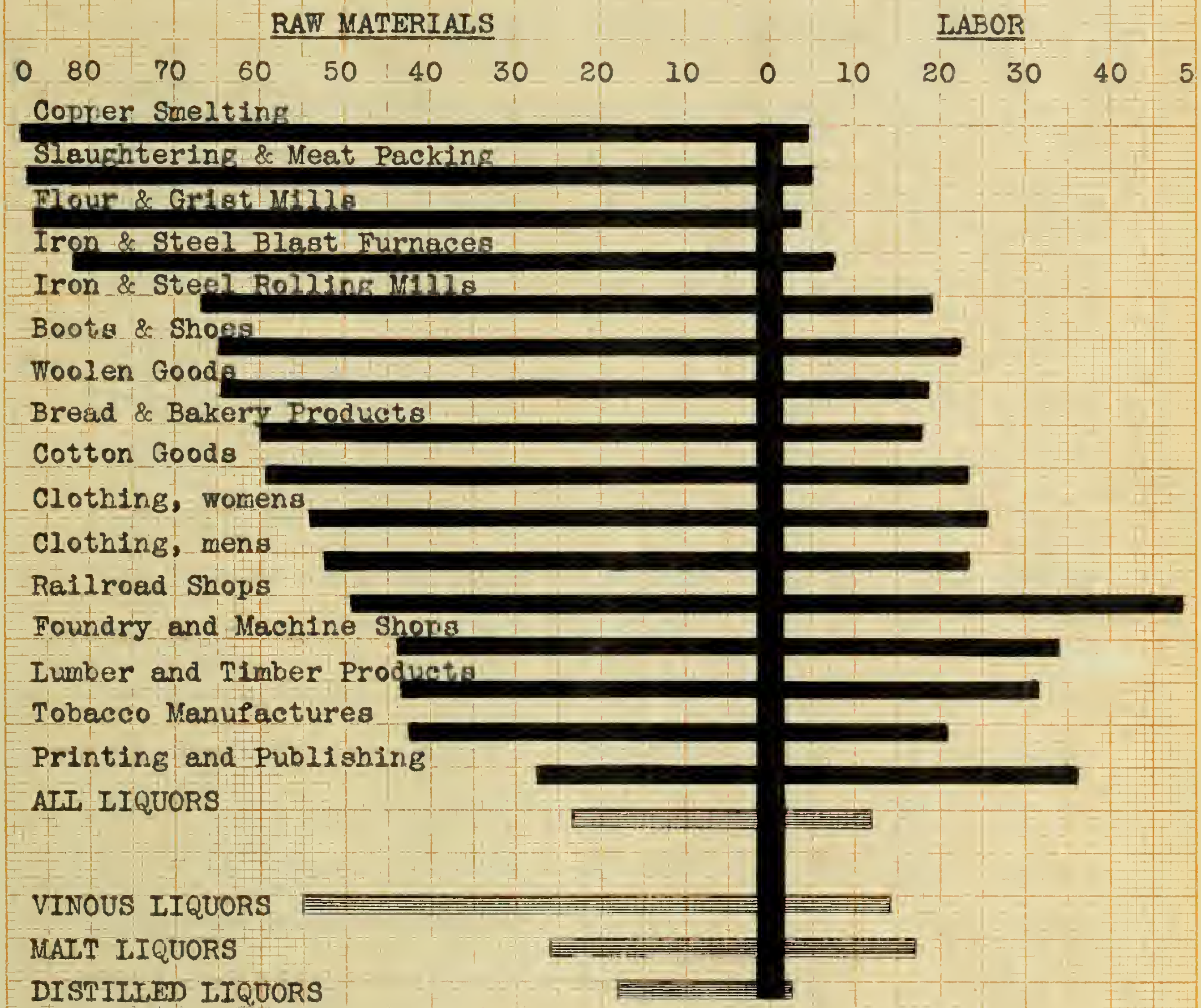
[1] Grain distilled spirits, 126,453,592 gallons; fruit distilled spirits, 2,204 184 gallons.

Plate 6

PER CENT OF PRODUCTS VALUE WHICH GOES FOR LABOR AND RAW MATERIALS



Constructed from statistics in the United States Census, 1910.

Table 4

(classed by value of products)

INDUSTRY	VALUE OF PRODUCTS	COST OF RAW MATERIALS	WAGES AND SALARIES	SHARE THAT LABOR RECEIVES	SHARE THAT RAW MATERIAL RECEIVES
Slaughtering & Meat Packing --	1,370,568	1,202,828	71,699	5.23	87.74
Foundry and Machine Shops -	1,228,475	540,011	415,316	33.80	43.96
Lumber and Timber -	1,156,129	508,118	366,167	31.66	43.94
Iron and Steel- (rolling mills)	985,723	657,501	189,392	19.21	66.70
Flour Mills -	883,584	767,576	33,981	3.84	86.89
Printing & Pub.	737,876	201,775	268,086	36.34	27.34
Cotton Goods --	628,392	371,009	147,271	23.43	59.02
ALL LIQUORS ---	596,550	139,199	70,907	11.96	23.33
Clothing, Mens-	568,077	297,515	133,000	23.42	52.34
Boots and Shoes	512,798	332,738	117,092	22.81	64.90
Woolen Goods --	435,979	282,878	82,524	18.83	64.88
Tobacco Man'f's	416,695	177,186	86,134	20.65	42.52
Railroad Shops-	405,601	199,413	198,683	48.99	49.17
Bread and Bakery	396,865	238,034	73,115	18.42	59.99
Iron and Steel (blast furnaces)	391,429	320,638	31,139	7.95	81.91
Clothing, Womens	384,752	208,788	98,986	25.72	54.23
Copper Smelting	378,806	333,532	15,816	4.81	88.02
MALT LIQUORS	374,730	96,596	64,010	17,08	25.77
DISTILLED LIQUORS	204,699	35,977	5,062	2.47	17.57
VINOUS LIQUORS	13,121	6,626	1,835	13.98	50.51

share of the products value is usually given to labor, and when a small per cent of the products value is given for labor, a much larger proportional per cent of the products value is given for raw materials.As a general rule the two tend to balance each other.(Plate 6,Table 4) This tendency is interrupted in only two industries to any extent,viz. tobacco and liquor manufactures.

In the liquor industry taken as a whole, there is a marked alteration of this tendency,a small per cent of the products value being given to both labor and raw materials. This is true to the greatest extent in the distilled liquor industry and to the least extent in the vinous liquor industry.

Four of these leading industries give a small per cent of their products value to labor,viz. copper smelting, slaughtering and meat packing, flour and grist mills and iron and steel furnaces.However, unlike the liquor industry, these four industries give the largest per cent of their products value to raw materials.

The total per cent of the products value which goes for both labor and raw materials in these seventeen industries, is in every case over sixty per cent with the exception of the combined liquor industry where it is thirty five per cent. In the vinous, malt and distilled liquor industries taken separately, the per cents are sixty nine, forty three and twenty respectively.

Thus in the distilled liquor industry twenty per cent

of the products value is accounted for under labor and raw materials.The other eighty per cent is available to pay taxes to the government and give profits to the stockholders. In the malt liquor industry forty three per cent goes for labor and raw materials and sixty seven per cent is left for taxes and profits. The vinous liquor industry approaches more nearly the normal of the sixteen leading industries in the proportion of the products value which is devoted to both labor and raw materials,sixty nine per cent being thus accounted for leaving thirty one per cent for taxes and profits.

VI. VALUE ADDED BY MANUFACTURE

When only a small per cent of a products value is given to raw materials and labor, the value attributed to manufacture is usually proportionally great.This is true in the case of the liquor industries.(Plate 7, Table 5)

The combined liquor industry adds a greater value to the raw material by the process of manufacture than does any of the other leading industries of the country,viz. three hundred and fifty per cent.The greater portion of this large added value is not given to wages---only fifteen and sixty three-hundredths per cent going to that source, while raw materials claim twenty four per cent.(Plate 6)

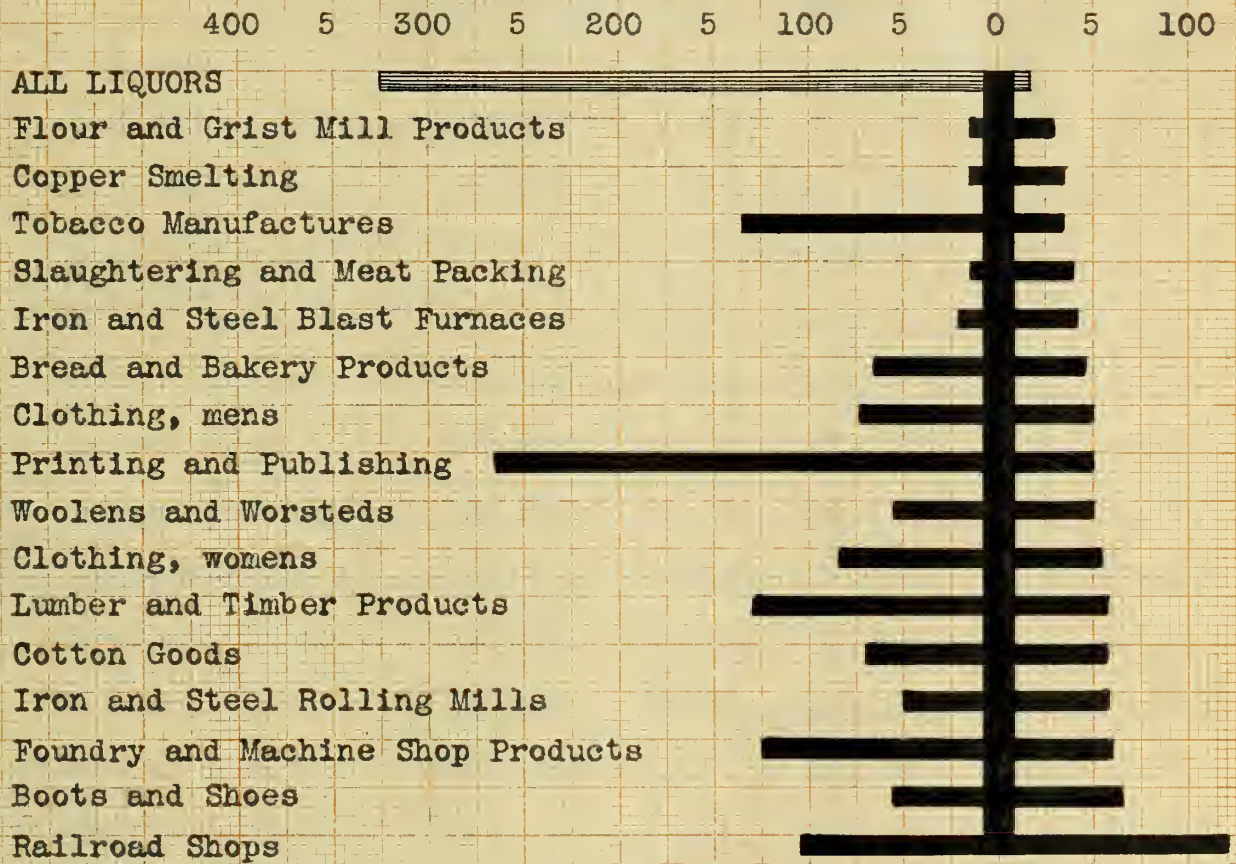
The distilled liquor industry adds more value by the process of manufacture (viz.four hundred and sixty nine per cent) and gives the least amount of this value to wages (three per cent)

Plate 7

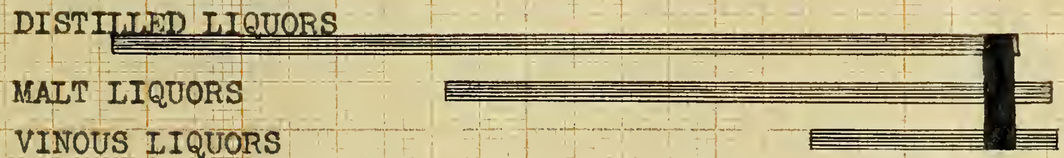
IN THE SEVENTEEN LEADING INDUSTRIES OF THE UNITED STATES

1. PER CENT OF VALUE ADDED TO RAW MATERIALS BY MANUFACTURE
(To the left of division line)

2. PER CENT OF VALUE ADDED BY MANUFACTURE, THAT IS DEVOTED TO WAGES AND SALARIES.
(To the right of division line)



IN THE THREE LIQUOR INDUSTRIES OF THE UNITED STATES



Constructed from statistics in the Census Abstract of the U.S.1910.

Table 5

(classed by cost of materials)

INDUSTRY	COST OF MATERIALS	VALUE ADDED BY MAN'F	WAGES & SALARIES	% ADDED TO RAW MATERIALS BY MAN'F	% ADDED BY MAN'F THAT IS DEVOTED TO WAGES & SALARIES
Slaughtering etc.	1,202,828	167,740	71,699	13.9	42.74
Flour Mill Prod.-	767,576	116,008	33,981	15.1	29.29
Iron and Steel -- (rolling mills)	657,501	328,222	189,392	49.9	57.70
Foundry Products-	540,011	688,464	415,316	125.4	60.32
Lumber Products -	508,118	648,011	366,167	127.5	56.51
Cotton Goods ----	371,009	257,383	147,271	69.3	57.22
Copper Smelting -	333.532	45,274	15,816	13.5	34.94
Boots and Shoes -	332,738	180,060	117,092	54.1	65.03
Iron and Steel -- (blast furnaces)	320,638	70,791	31,132	22.1	43.97
Clothing, Mens --	297,515	270,562	133,000	90.9	49.16
Woolen Goods ----	282,878	153,101	82,524	54.1	53.90
Bread Products --	238,034	158,831	73,115	66.7	46.06
Clothing,Womens -	208,788	175,964	98,986	84.3	56.22
Printing & Pub. -	201,775	536,101	268,086	265.6	50.00
Tobacco Man'f's -	177,186	239,509	86,134	135.1	35.96
Railroad Shops --	199,413	206,188	198,683	103.4	96.33
ALL LIQUORS -----	139,199	453,351	70,907	325.6	15.63
MALT LIQUORS ----	96,596	278,134	64,010	287.9	23.02
DISTILLED LIQUORS	35,977	168,722	5,062	469.0	3.001
VINOUS LIQUORS --	6,626	6,495	1,835	98.0	28.25

or to raw materials (eighteen per cent) than is true in the other two liquor industries.

The vinous liquor industry attributes the least of its products value to the process of manufacture (one hundred per cent) than the other two liquor industries, and gives more of its value for raw materials (fifty per cent) and labor (thirteen per cent).

Usually the completed product of one industry is the raw material of the other.However in the case of the liquor industry this is not true to such an extent as it is in most of the other industries of the country, and the above facts might be misleading to a certain extent unless this factor be taken into consideration. The process of manufacture of liquors is apparently the only process of manufacturing among the other leading industries which takes the actual raw material and turns out from it a finished product. In some of the other industries like boots and shoes, or cotton manufactures, partly finished material is termed in the Census Reports as raw materials and thus these industries cannot show such a great value added my manufacture.

In the distillery industry a bushel of corn is directly manufactured into about eight and one-half gallons of whiskey. The enormous value added my manufacture is readily seen by tracing a bushel of corn through the process of manufacture until it comes out a finished product.

The original cost of a bushell of corn is about sixty

cents.This is convertible into seventeen quarts of whiskey or four and one-quarter gallons. The distillery profit is about eighty cents a gallon or three dollars and forty cents for one bushel of corn. The government takes ninety cents on every gallon or three dollars and sixty cents on every bushel of corn. This taken together with the distillery profit makes the product from a bushell of corn cost seven dollars before it reaches the retailer. The retailer reduces the four and one-quarter gallons to six and one-half gallons. There are sixty drinks to the gallon, so that the six and one-half gallons will make three hundred and ninety drinks, which are usually sold at ten cents per drink, thus making the products from a bushel of corn cost thirty nine dollars after they have left the retailer.[1]

As stated by the Census Department, a large amount of the value added by manufacture is turned over to the government for taxes and of necessity there must be a large value added to the raw materials in order to meet this tax, but it would appear that the enhanced cost of the finished product to the consumer is a means of enormous profit to the retail liquor dealer.

VII. LABOR EMPLOYED IN THE LIQUOR INDUSTRIES

It was shown(Table7) that the liquor industries, especially the malt and distilled, use only a small per cent of raw

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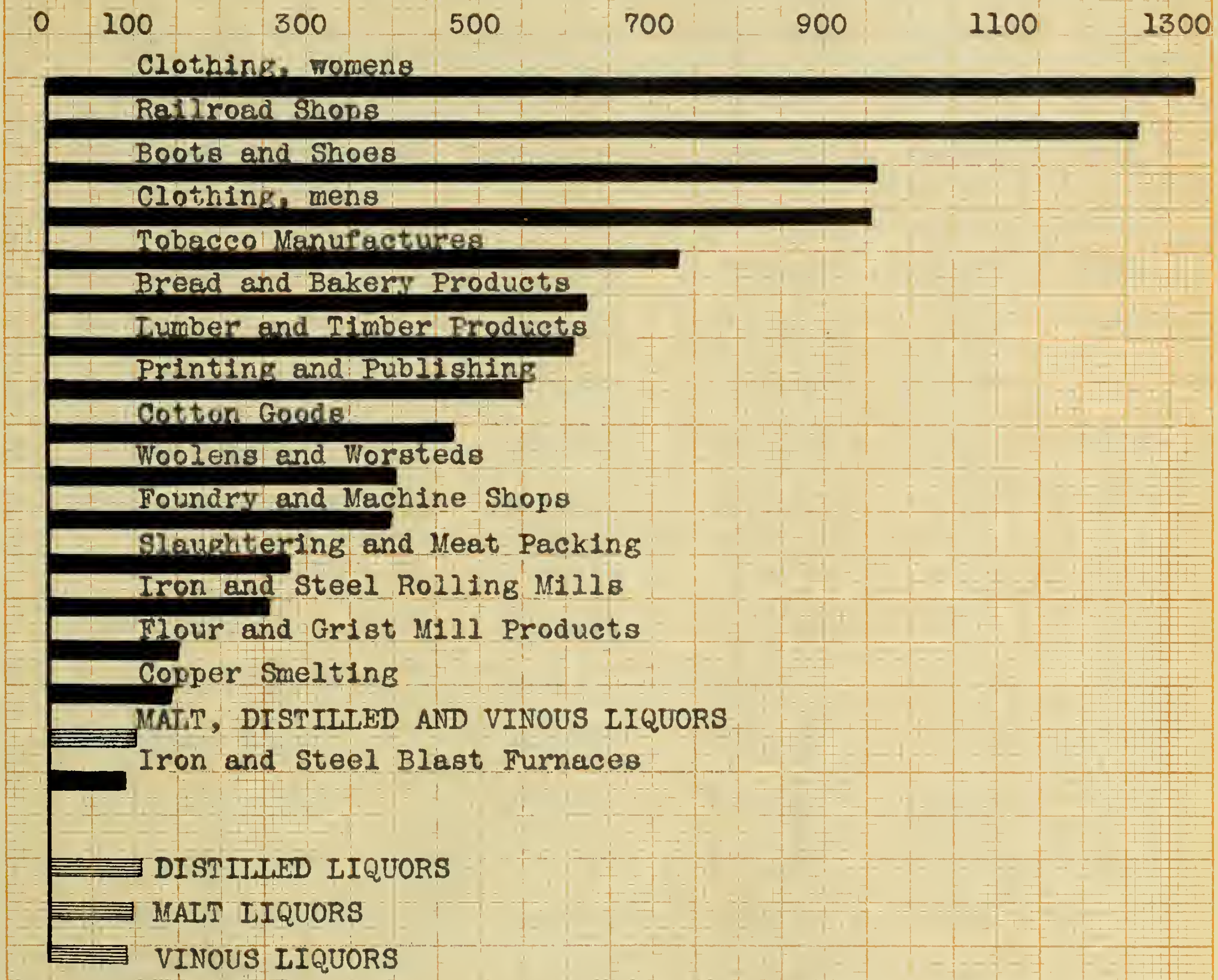
[1] James C. Fernald,'The Economics of Prohibition,'p,365.

Plate 8

NUMBER OF SALARY AND WAGE EARNERS EMPLOYED PER YEAR FOR EVERY $ 1,000,000 INVESTED IN THE SEVENTEEN LEADING INDUSTRIES OF THE UNITED STATES



Constructed from statistics in the Census Abstract of the U.S.1910.

Table 6

(classified according to capital invested)

INDUSTRY	CAPITAL INVESTED (terms of 1000)	NUMBER OF WAGE EARNERS & SALARIED EMPLOYEES	AMOUNT OF CAPITAL NEEDED TO EMPLOY ONE WORKER	NUMBER OF WORKERS FOR EACH MILLION DOLLARS INVESTED
Foundry Products-	1,514,332	605,634	2,500	400
Lumber Products -	1,176,675	736,164	1,598	625
Iron and Steel -- (rolling mills)	1,004,735	260,715	3,854	259
Cotton Goods ----	822,238	387,394	2,122	471
ALL LIQUORS -----	771,516	76,341	10,100	100
Printing & Pub.--	588,346	358,042	1,643	608
Iron and Steel -- (blast furnaces)	487,581	43,013	11,335	89
Woolen Goods ----	430,579	174,444	2,468	405
Slaughtering etc.	383,249	107,067	3,579	279
Flour Mills Prod.	349,152	51,484	6,781	147
Clothing, Mens --	275,320	262,935	1,047	954
Tobacco Man'f's.-	245,660	180,003	1,364	733
Railroad Shops --	238,317	301,271	791	1,264
Boots and Shoes -	222,324	214,085	1,038	963
Bread & Bakery --	212,910	117,340	1,814	551
Clothing,Womens -	129,305	171,539	763	1,328
Copper Smelting -	111,443	116,825	6,624	151
MALT LIQUORS ----	671,158	66,086	10,165	98
DISTILLED LIQUORS	72,450	7,765	9,325	107
VINOUS LIQUORS --	27,908	2,490	11,200	90

materials in proportion to the amount of capital invested and the value of their manufactured products.

In regard to the number of workers employed in proportion to the capital invested, the combined liquor industry shows a smaller number of employees for the amount of capital invested, than any other of the seventeen leading industries with the exception of the iron and steel blast furnace industry. (Plate 8,Table 6)

In these seventeen industries an average invested capital of three thousand and eighty one dollars gives employment to one laborer for one year.

In the brewery industry an invested capital of ten thousand one hundred and sixty five dollars gives employment to one laborer for one year, while in the entire liquor industry it takes ten thousand one hundred dollars of capital to employ one man for the same length of time. In other words it takes six thousand dollars more, on the average, to employ one man in the combined liquor industry for one year, than it would take to employ one man for one year in any one of the other seventeen industries with one exception.

If the capital invested in the liquor industry was invested in most any of these other industries; it would, on the average, give employment to two hundred and fifty thousand men instead of seventy six thousand. Thus almost two hundred thousand fewer laborers, with an annual earning capacity of one hundred and ten million dollars, are used in the liquor industry

per amount of capital invested, than would be used on the average in any one of the other industries here represented.

From the figures herein shown, it appears that the different liquor industries are very highly capitalized, in proportion to the amount of labor employed.

VIII. RATE OF WAGES PAID IN THE LIQUOR INDUSTRIES

The yearly salary and wage of the employees of the liquor industries stand relatively high in comparison with the yearly salary and wage of the employees in the other leading industries of the country.(Plate 9) The average yearly wage and salary for the group of industries here considered is six hundred and thirty seven dollars, while the average yearly wage and salary for the combined liquor industry is nine hundred and twenty nine dollars.

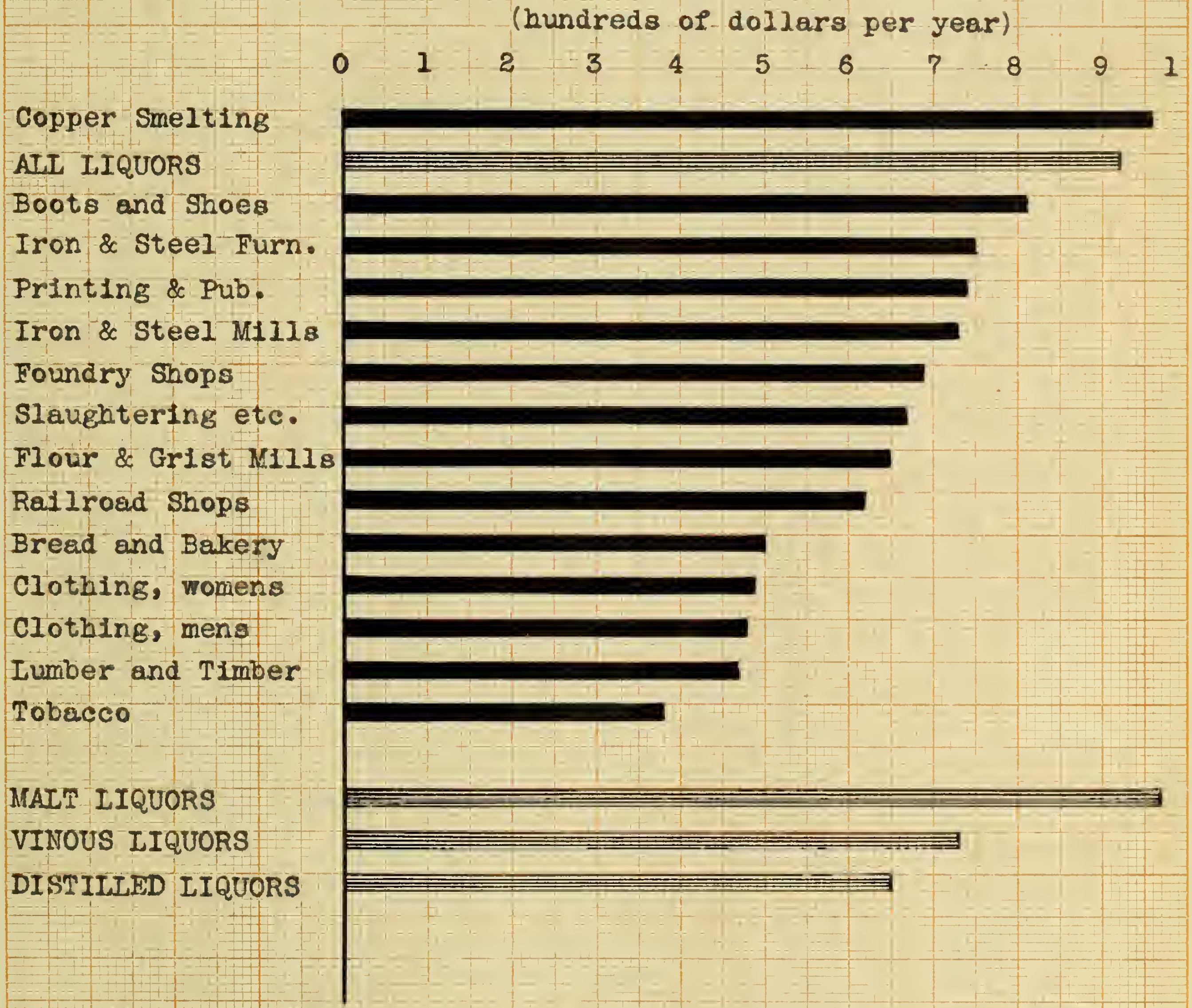
The malt liquor industry pays the highest average yearly salary and wage of the three liquor industries or approximately nine hundred and seventy dollars. Next comes the vinous liquor industry with seven hundred and thirty five dollars, and the lowest of the three is the distilled liquor industry with six hundred and fifty dollars.

One of the chief reasons for such relatively high yearly wages and salaries paid employees in these liquor industries is the small amount of women and child labor used.(Plate 10,Table 1)

In the malt liquor industry four-tenths per cent of the total labor employed is child labor, and in the distilled liquor

Plate 9

THE AVERAGE WAGES AND SALARIES PAID IN THE FOURTEEN LEADING INDUSTRIES OF THE UNITED STATES, COMPARED WITH THE AVERAGE WAGES AND SALARIES PAID IN THE LIQUOR INDUSTRIES

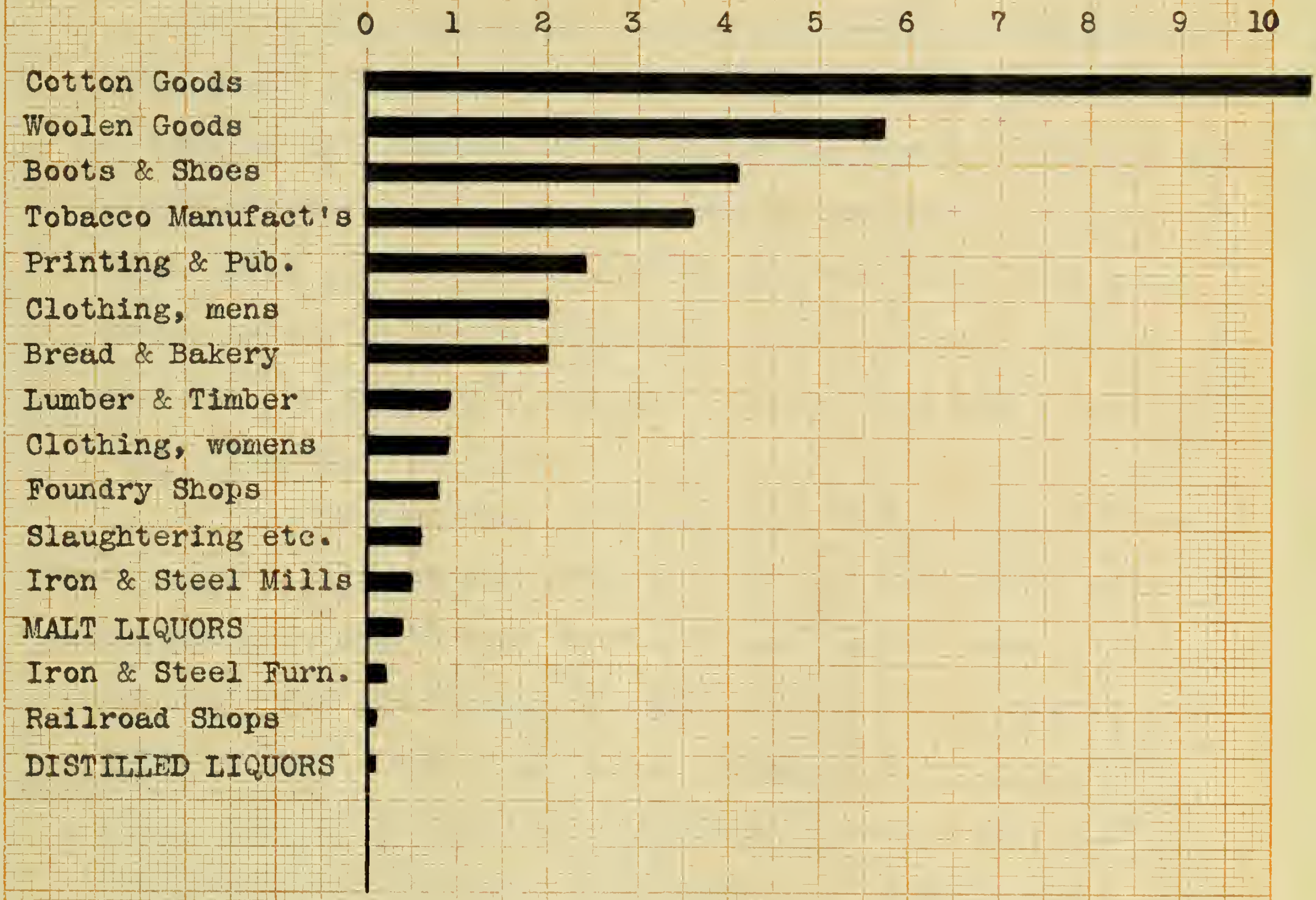


Constructed from statistics in the Census Abstract of the U.U. 1910.

industry one tenth per cent of the total employees are children. In the vinous liquor industry the amount of child labor is practically nil.

Plate 10

PER CENT OF CHILD LABOR EMPLOYED IN EACH OF THE FOURTEEN LEADING INDUSTRIES OF THE UNITED STATES, COMPARED WITH THE PER CENT OF CHILD LABOR EMPLOYED IN THE LIQUOR INDUSTRIES



Constructed from statistics in the Census Abstract of the U.S. 1910.

PART II

RELATION OF THE LIQUOR INDUSTRY TO INDUSTRIAL EFFICIENCY

Chapter One

THE EFFICIENCY MOVEMENT

After a period of remarkable industrial expansion, in which large scale production has followed closely the period of invention, the question of efficiency has rapidly forced itself upon the attention of every industrial organizer. Until recent times large scale production often included much large scale waste, which, as modern competition grows stronger, must be reduced to the minimum if organizations are to compete successfully with one another.

A few years ago, entrepreneurs while taking great care of their steel machines oftentimes did not fully realize how necessary it was to take even more care of the human machines who daily ran the mechanical ones. The modern efficiency idea takes as great care of its human machines as it does of its steel ones. It installs good sanitation, rest rooms, shorter hours and other favorable conditions for the employees because it realizes that the health and clear brain of the laborer bears a direct relation to the product, which the machine that he operates turns out.

The law of "natural selection" is fatally accurate in modern industrial life. Competition is strong and establishments

with the most efficient labor survive, while the incapable ones fail. The workman who cannot keep up to the task set before him, loses his job to the more efficient workman, and takes his place eventually among the great army of the unemployed.

The magnitude of the problem of efficiency is known to all social workers. Prof.Devine in an investigation as to the principal disabilities of five thousand dependent families in New York City, places unemployment as the cause in sixty nine per cent of the cases.[1]

Nor is this great per cent of unemployment due to lack of demand for labor. Everywhere there is a demand for labor, but this demand is in direct proportion to its efficiency. High-grade, efficient labor is demanded, but incapable, vacillating laborers are nowhere wanted and while they may want to work, their capacity or ability to produce results is so low that it is below the margin of the profitability of the employer and cannot be utilized by organizations which have to employ the most efficient labor in order to compete successfully in commercial enterprises.[2] No employer can afford to work with a labor force which is devitalized physically by a decrease in (1) physical efficiency, (2) intellectual keenness, (3) disease resisting power, (4) length of life. What effect has alcohol, used in moderate quantities, on these four phases of efficiency?

1. Edward T. Devine, Misery and its Causes,p,204.
2. Prof.Franklin H. Giddings says that "the unemployed are always the relatively inefficient."Pol.Sci.Quart.,Vol 2,p,636.

Chapter Two

THE EFFECT OF ALCOHOLIC LIQUORS ON PHYSICAL EFFICIENCY AND INTELLECTUAL KEENNESS

For the last two decades physiologists and psychologists in Europe have been making experiments with alcohol, in order to secure an accurate knowledge of its effects on the human system. The evidence which they present is some of the first trustworthy information in regard to the moderate use of alcoholic liquors and physical efficiency.

These experiments have for the most part been recently published in foreign scientific books and journals in the midst of other scientific material and has thus far been difficult of access. Recently however, Prof. M.A.Rosanoff and Dr. A.J. Rosanoff have presented in condensed form to the American people the most valuable results of these investigations,[1] while Dr. W.H.Rivers in his lectures before the Royal College of Physicians (1906) has embodied the same and other investigations in a more complete work.[2] The following experiments are taken in part from the original reports of several German scientists, and in part from translations by various writers, the chief of whom are the above mentioned.

[1] Prof.M.A.Rosanoff is Director of Chemical Laboratories in Clark University,Worcester,Mass; and Dr.A.J.Rosanoff, Second Assistant Physician of Kings Park State Hospital, Long Is.,N.Y. McClures Magazine,Vol.32.,p,558-67.

[2] W.H.R.Rivers,M.D.,F.R.C.P. Influence of Alcohol and Other Drugs on Fatigue.(1908)

I. MODERATE DRINKING AND MUSCULAR WORK

It has generally be acknowledged that excess of alcoholic liquors is deleterious to the human system and reduces muscular energy, but until the present time moderate quantities have often been used by large classes of workmen in the belief that it stimulated muscular energy. Dr.L.Schnyder and Prof.Paul Dubois at Berne, Switzerland performed some experiments in 1903 to show the influence of small quantities of alcohol on the capacity for doing work.[1]

"The muscle chosen for these tests was that of the index finger of the right hand--one of the best trained muscles of the body, and therefore little subject to accidental influences. The measuring apparatus employed was the celebrated ergograph invented by Angelo Mosso, with improvements by Prof. Dubois. In using this, the hand was fixed by holding on to a wooden peg; the arm was rendered immovable by a clamp; and a weight of several kilograms, suspended by a string passing over a pulley, was raised and lowered until complete exhaustion set in. This process was repeated twelve times with intervening rests of one minute. The length of the pull was recorded by a pencil on a strip of ruled paper. The sum of the lengths of the single lines is easily translated into "meter-kilograms"--that is, the work done in raising one kilogram through one meter against the gravity of the earth."

1. McClures Magazine,Vol.32.,p,558-67.

"Since alcohol is a food--in the sence that it is burned in the human body and thus produces energy--Prof.Dubois believed its nutritive value must play some part in its effects on the muscular system. Accordingly, he carried on five different experiments to determine its action under different conditions. The object of the first three of these was to bring out the effect of alcohol as compared with that of a food in the ordinary sense of the term."

(a) THE EFFECT OF ALCOHOL TAKEN WITHOUT FOOD

Experiment No. 1 was a measurement of muscular efficiency four hours after meals, without either alcohol or ordinary food being given.

Experiment No. 2 consisted in similar measurements at the same hour of the day--between twelve and half past twelve o'clock--but shortly after taking a certain quantity of readily digestible nitrogenous food; namely, thirty grams of tropon, a food for the sick and convalescent,containing ninety per cent of animal and vegetable proteids.

Experiment No. 3 consisted in similar measurements at the same time of the day, but shortly after taking a moderate quantity of alcohol, equal in heat value to the amount of food given in experiment No.2. This was in the form of 150 cubic centimeters (about two-thirds of a cupfull) of Bordeaux wine, containing 14.7 grams of alcohol, and administered fifteen minutes before the experiment.

To obtain as reliable results as possible, and eliminate all accidental factors, each result in each class of experiment--given in the following table--was obtained by striking an average of ten single experiments taken on ten different days.

WORK DONE ---- METER KILOGRAMS

Period Number .	1 (Nothing) .	2 (Food) .	3 (Alcohol)
1 ------------	8.089	8.656	8.473
2 ------------	3.732	3.911	4.227
3 ------------	3.102	3.447	3.288
4 ------------	3.031	3.244	3.120
5 ------------	2.904	3.115	2.992
6 ------------	2.838	3.033	2.821
7 ------------	2.863	2.938	2.816
8 ------------	2.903	3.054	2.709
9 ------------	2.875	3.108	2.674
10 -----------	2.885	3.097	2.725
11 -----------	2.939	3.106	2.745
12 -----------	2.843	2.913	2.732
Twelve periods	41.004	43.622	41.332
First 5 periods	20.858	22.373	22.100
Last 7 periods	20.146	21.249	19.222

"It will be noted that the total of the second experiment, in which the thirty grams of tropon were taken, shows an increase of 2.618 meter-kilograms over the total of the first, in which no food was taken. That is, the food increased the working capacity 6.4 per cent."

"The total of the third, in which the wine was taken, was 0.318 meter-kilograms more than the first (without food), this constituting the slight increase of 0.8 per cent. It appears then, that while alcohol effected a much smaller increase in muscular efficiency than an equivalent amount of ordinary good food, it still produced an increase."

"But let us examine the figures more closely. The totals of the first five working periods in experiments 1.(Nothing), 2.(Tropon), 3.(Alcohol), are respectively: 20.858, 22.373, and 22.100. The difference between the first two is 1.515 or 7.3 per cent of 20.858. This was the per cent of increase produced by tropon <u>at first</u>. On the other hand, the difference between experiment No.3 and No.1 is 1.142 or 6.6 per cent of 20.858. This was the per cent increase produced by alcohol <u>at first</u> . So <u>at first</u> alcohol produced really a marked increase in muscular efficiency, although this increase was smaller than that produced by the tropon <u>at first</u>. In the last seven periods we find the totals of the three experiments to be respectively: 20.146, 21,249, and 19,222. The difference between the first two experiments is 1.103 or 5.5 per cent of 20.146. This is the per cent increase produced by the tropon during the <u>latter stage</u> of

the experiment. The difference between the last and the first experiment is 0.924 or minus 4.6 per cent of 20.146. So during the latter stage of the experiment the effect of alcohol was a marked decrease in muscular efficiency. It is clear, also, that the total work done during the experiment with alcohol would have been less, and not slightly greater, than in the experiment with nothing whatever, if both experiments had been prolonged."

The conclusion from the experiments seems to be that, "unlike an ordinary food, alcohol, when taken in moderate quantity on an empty stomach, has two distinct effects on the muscular system,viz., a strengthing one and a weakening one. During the first brief stage after it is taken, the strengthening effect predominates, the alcohol probably being utilized as a food by the exhausted body.But no sooner is the first stage over, than the weakening effect becomes more prominent, the alcohol probably acting injuriously upon the nervous system."

Other experiments along this line have shown similar results. Thus Dr. A.F.Hellsten, after an extensive series of experiments carried out at Helsingfors in 1903 - 1904, draws the following conclusion:[1] "Almost immediately after being introduced into the system, alcohol raises the working capacity of the muscles. From twelve to forty minutes later,however, a lowering sets in, and the state of lowered muscular efficiency lasts at least two hours. Thus alcohol acts at first as a stimulating, afterwards as a paralizing agent."

[1] An abstract may be found in the Muenchener Medicinische Wochenschrift, for the year 1904,p,1894. Original experiments found in Skandinav.Arch.F.Physiol., Bd.16, S.139.

(b) THE EFFECT OF ALCOHOL TAKEN WITH FOOD

The fourth and fifth series of experiments conducted by Dr. Schnyder and Professor Dubois were made to ascertain the effect of alcohol on an organism well supplied with nourishment, the idea being that if alcohol had some other relation besides its effect as a food, a system well supplied with ordinary nourishment might refuse to profit by the superfluous nutrition offered by the alcohol, and so manifest only its other action. That other action, whatever it might be, would then become measurable by itself. The two concluding experiments were consequently these:

Experiment No.4 consisted of the same measurements as in the first three experiments, carried out at about the same hour of the day, but shortly after a good meal without alcohol, the meal consisting of soup, meat, vegetables and bread.

Experiment No.5 consisted in similar measurements, taken shortly after meals during which a moderate quantity of alcohol was consumed. The food consumed was the same as in experiment No.4; while the alcohol was administered in the form of 300 cubic centimeters of Bordeaux Wine, containing 29.4 grams of alcohol.Doctor Schnyder states that this is about the quantity referred to as "a good glass of wine", considered by many people as a moderate, perfectly harmless and even indispensable drink. The tabulated results of experiment 4 and 5 follow, each figure, as in the first three experiments, being

an average from ten single experiments on ten different days:

WORK DONE ---- METER-KILOGRAMS

Period number	4 (food only)	5 (food and alcohol)	loss of efficiency
1 -----------	7.969	7.370	
2 -----------	4.418	3.872	
3 -----------	3.652	3.373	
4 -----------	3.440	3.182	
5 -----------	3.245	3.016	
6 -----------	3.215	3.136	
7 -----------	3.248	2.996	
8 -----------	3.223	3.004	
9 -----------	3.233	3.076	
10 -----------	3.254	2.929	
11 -----------	3,322	2.993	
12 -----------	3.282	2.922	
Twelve periods	45.501	41.869	8.0 %
First 5 periods	22.724	20.813	8.4 %
Last 7 periods	22.777	21.056	7.6 %

"A peculiar fact is shown here: while alcohol is a food, the human body will not use it as such when it has an ample supply of other food. Consequently, the weakening influence of alcohol, which is here got at by itself, is seen

to be at work continuously." The total loss of efficiency in the twelve working periods is 8 per cent and the weakening effect is really greater <u>at first</u>.

The conclusion would seem to be that, "moderate amounts of alcohol taken with a meal effect a very considerable lowering of the capacity for doing muscular work---."

II.MODERATE DRINKING AND THE PROCESS OF WRITING

Dr. Martin Mayer at the University of Heidelberg published in 1901 the results of his experiments along this line.[1] The following is a summary of his results:

Time Taken in Writing ---- Before and After Drinking Alcohol

First Experiment ---- 30 grams of Alcohol[2]

	Before	After	Retardation
(A) Writing 1 to 10 ---	337.1 zetas[3]	355.8 zetas	5.6 %
(B) Writing 10 to 1 ---	347.5 "	371.8 "	7.0 %
(C) Writing "inm" ---	136.2 "	146.1 "	7.3 %

Second Experiment ---- 60 grams of Alcohol

(A) Writing 1 to 10 ---	335.0 zetas	365.5 zetas	9.1 %
(B) Writing 10 to 1 ---	348.7 "	384.1 "	10.2 %
(C) Writing "inm" ---	137.5 "	154.3 "	12.2 %

---

[1] "Ueber die Beeinflussung der Schrift durch den Alkohol", Psychologische Arbeiten. Vol.3.,p,535 - 586.

[2] As much alcohol as contained in one and one-third tumblersful of Claret.

[3] Unit of time employed was 1-100 of a second,arbitrarily called a zeta. The two experiments were performed a month apart.

"A glance at the table shows, first, that alcohol invariably retards the process of writing to a very considerable extent; secondly, that the greater the doses of alcohol taken, the greater is the retardation; thirdly, that the retardation increases with the complexity of the task: one is more accustomed to write 1 to 10 than 10 to 1, and every one of us has more frequently counted backward from 10 to 1 than written the characters "inm"."

The results of these two sets of experiments were taken from averages, there being in the cases in which alcohol was taken, from 16 to 60 separate trials. Comparison of the results of experiments taken at different times shows a remarkable uniformity, there being less than one per cent difference between the experiments made at the two different times.

The conclusion from this set of experiments seems to be that, "moderate drinking retards to a very considerable extent the activities that are intermediate in complexity between purely muscular and physical work ---."

III. MODERATE DRINKING AND THE HANDICRAFTS

Gustav Aschaffenburg's experiments deal with four professional typesetters, viz., F.S., J.L., C.H., and K.O.G.[1]

---

[1] "Praktische Arbeit unter Alkoholwirkung", Psychologische Arbeiten, Vol.1.,p,608-626.(1896)

These men were moderate drinkers and worked at their ordinary places, and in precisely the ordinary way, except that the copy from which the type was set was always printed in order to secure perfect uniformity.

The experiment extended over a period of four days. The first and third days were observed as normal days, no alcohol being given. On the second and fourth days each worker received 35 grams(three-fourths of a tumblerful)of alcohol, in the form of strong Greek Wine. The following summary table shows the results from these investigations:

Number of 'ems' set up from printed copy

	MONDAY (no alcohol)	TUESDAY (alcohol)	WEDNESDAY (no alcohol)	THURSDAY (alcohol)
F. S. -------	2339	2212	2560	2353
J. L. -------	2005	2449	2487	2492
C. H. -------	2241	2265	2458	2314
K. O. G.-------	1528	1449	1608	1495

In industrial work it is a recognized fact that there should be a gradual increase of work done each day as the week progresses.[1]

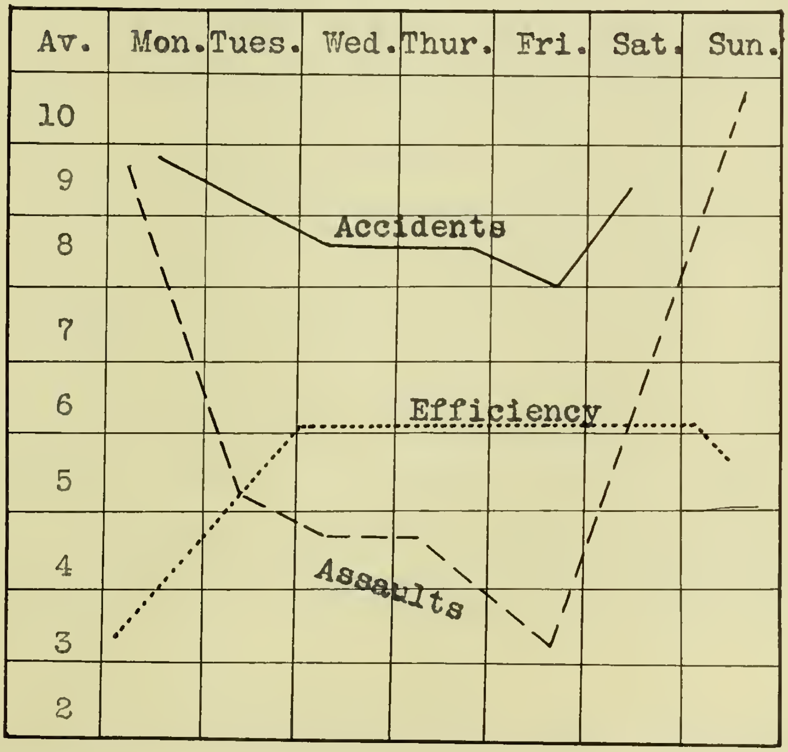
---

[1] The diagram shown below, gives the results of investigations made by A.H.Stehr,M.D. of Wiesbaden, on the relation of alcohol to accidents,assaults and efficiency. The accident statistics are from the German National Statistics 1897. The record of the assults was taken from the German National Statistics 1898-1899, while the efficiency statistics were gath-

But we see the opposite of this fact in the above table. In the five cases underlined, the number of 'ems' set up on Tuesday and Thursday is not greater, but <u>less</u> than the number set up on Monday and Wednesday respectively. In the other cases the increase is so small as to be practically nothing.

Under the normal short periods of time the increase in efficiency from day to day is about the same. Thus from the fact that F. S. set up 221 more ems on Wednesday than on Monday, it may be estimated that his 'experience-increase' at that time amounted to 110 ems per day, and that under normal condi-

ered from the reports of a bottle factory in Dresden.



Anti-Saloon League Year Book,1913.p,257.

tions he should have set up 2449 ems on Tuesday and 2670 ems on Thursday.(Plate 11)

However F. S. instead of setting up 2449 ems on Tuesday set up only 2212 ems, a difference-loss of 237 ems or about 9.7 per cent. In this manner the following table is deduced:

Percentage Losses of Efficiency

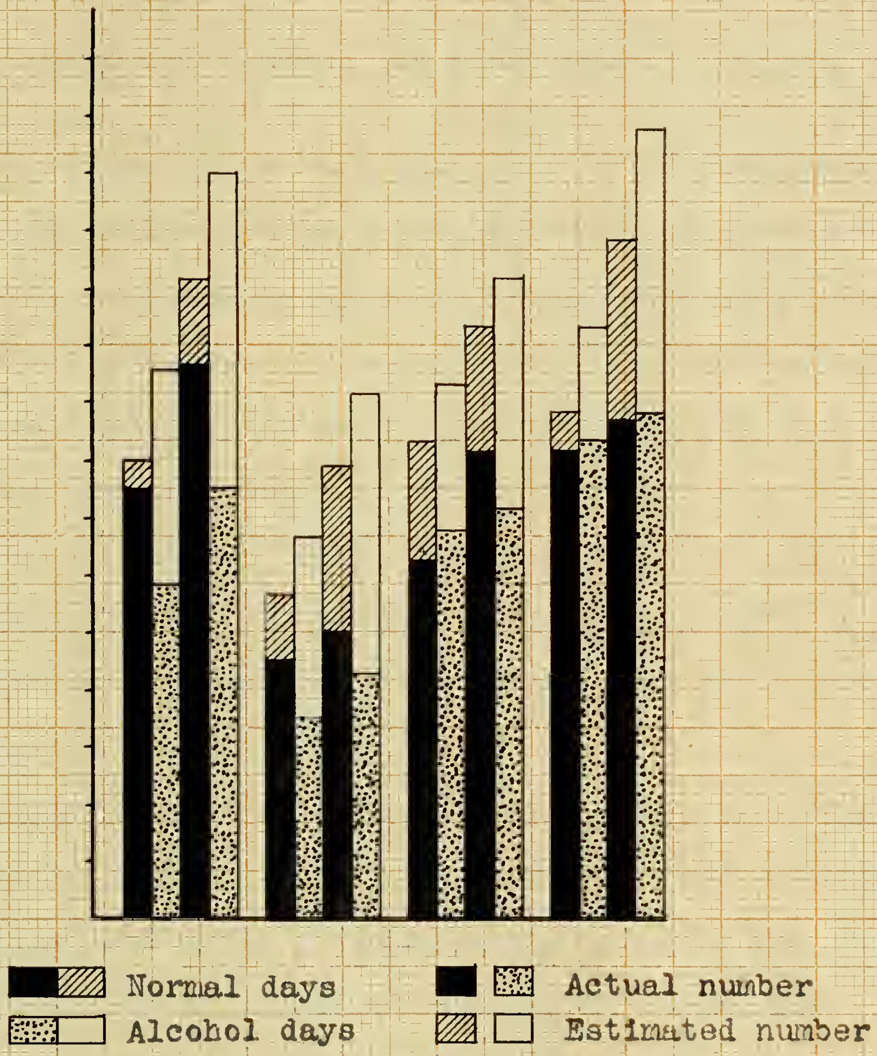
	TUESDAY	THURSDAY
F.S. -------------	9.7 %	11.9 %
J.L. -------------	0 %	1.4 %
C.H. -------------	3.6 %	9.9 %
K.O.H. -------------	7.6 %	9.3 %

The different typesetters are affected differently by alcohol as might be expected; one of the workers being uneffected, but the other three show heavy losses amounting in the most pronounced case to almost 12 per cent. The fact that Thursday's losses are heavier than Tuesday's points out the fact that the effects of alcohol are cumulative. The effects of Tuesday's drink is still present on Thursday and so must be present on Wednesday. The above estimates for efficiency losses, however, considers Wednesday normal, which is not the case and so if anything should be higher than they are, but by what percentage has not been determined by Professor Aschaffenburg.

The conclusion of this experiment apparently shows that an artisan's efficiency is reduced considerably by moderate

Plate 11

THE NUMBER OF LETTERS ACTUALLY SET UP, AND THE NUMBER THAT IT IS ESTIMATED SHOULD HAVE BEEN SET UP



Psysiologische Arbeiten, Vol.1, p.625.

drinking, and that its effects on the body is cumulative. As typesetting is paid for by measure, a worker would actually earn less on days when he consumed even "this small quantity of alcohol".

IV. MODERATE DRINKING AND INTELLECTUAL KEENNESS

Other experiments have been made by German Scientists in regard to the effects of alcohol on the human system.[1]

In one of these experiments the subject sits at a table with his finger at a telegraph key. "At a given signal, say a flash of light, he releases the key. The time that elapses between signal and response---is called the simple or direct reaction-time. ---Exner[2] found that when an individual had imbibed a small quantity of alcohol his reaction-time was lengthened, though the subject believed himself to be responding more promptly than before."

In other experiments more complicated, the mental processes were tested. "The subject would place a hand on a telegraph key, right and left. A signal would be given for one key by a red light, and for the other by a white light. After the ingestion of a glass of beer there was a marked disturbance of the mental processes. The keys would be released more rapidly than before the alcohol was taken, but the wrong key would be pressed more frequently."

[1] "Delusions Concerning Alcohol", R of R's,Vol.38,p,619.

[2] Experiments carried on in Vienna as long ago as 1873.

The effect of a "bottle of wine a day" (forty to eighty grams of alcohol are equal to a half-bottle or a bottle of ordinary wine) on the human system has been demonstrated by Kurz and Kraeplin.[1] In their four investigations (additionsversuche, lernversuche, associationsversuche and auffassungsversuche) they found that the consumption of this amount of alcohol reduced the working capacity of an individual's mind 25 to 40 per cent. In addition and learning by heart, the work was carried out for half an hour on each of 27 successive days. On six days no alcohol was taken; then for twelve days alcohol in the form of dilute spirits of wine (in a dose equivalent to 80 grams of absolute alcohol) was taken on each day, usually before going to bed; then for five days no alcohol was taken, and then again alcohol in the same manner for two days, followed by two normal days.

In the addition method, the results showed that after alcohol had been taken for about eight days there was a decrease in the amount of work done, although an increase might have been expected due to the continual daily practice in addition.

In the investigation of learning by heart carried out by the same subject, the injurious effect of alcohol was shown by the decrease in the ability to memorize on the days on which alcohol was given as compared with the normal days. The capacity

[1] "Ueber die Beeinflussing Psychischer Vorgange durch regelmaisigen Alkoholgenuss", Psychologische Arbeiten,Vol.3,p,417

for work however, was lowered, not only during the period when it was being taken, but also for some time afterwards.

Under the same conditions, Smith found that the power to add was impaired 40 per cent, and the power to memorize was reduced 70 per cent.[1] Professor Aschaffenburg says, in regard to these experiments, that "the so-called moderate drinker, who consumes his bottle of wine as a matter of course each day with his dinner,--- and who doubtless would declare that he is never under the influence of liquor,--- is in reality never actually sober from one week's end to the other."

From the majority of experiments and investigations performed by scientists within the last two decades, it may be concluded "that the initial effect of small quantities of alcohol, is to increase the capacity for work, but this effect is a transient one and is quickly followed by a marked loss of power." (Hellsten).

This "loss of power" or efficiency can be measured in the calculations of a modern industrial organization. The relative efficiency of different human agents of production is constantly being considered, the result of which consideration is to keep the most efficient agents and discard the relatively inefficient. The entrepreneur must form business judgments as to the labor that will "pay the best". A laborer whose efficiency

[1] Psychologische Arbeiten,1904. Vol.3.,p,451. Arch.F.Psychiatrie,1895. Vol.27.,p,968.

is ten, seven or even three per cent below that of his fellow, must eventually fall below the margin of employment.

The only great asset of the workingman is his productive power, his health or efficiency, which if maintained will usually afford him a comfortable return for himself and his family. If this efficiency is reduced to any degree, the laborer is handicapped in his struggle for existence and must of economic necessity be displaced by the more efficient workman.[1]

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[1] John Davidson, "The Bargain Theory of Wages",p,34. "It is not a matter of indifference to an employer which laborer is the marginal laborer. In slack times, it is the inefficient workman who is the first to be dismissed and the efficient workman who is surest of his place. This is because the employer has formed his own personal estimate of what the man is worth,--an estimate which is not final and may be modified by the attitude which the laborer chooses to make,--In the main however, it is an estimate of efficiency that determines who is the marginal laborer."

Chapter Three

ALCOHOL AND DISEASE

The next great cause of inefficiency is disease and premature death. Over 3,000,000 persons in the United States are always on the sick list, it is calculated, 1,000,000 of whom are in the working period of life, and three-fourths are actually workers.[1] These workers lose at least $700.00 per annum,[2] thus making the aggregate loss from sickness more than $500,000,000. Another $500,000,000 may be added to this as the cost of medicine and medical attendance, so that the total cost of illness is $1,000,000,000, one-half of which ,it is claimed, is preventable.

Professor Wilcox estimated the death rate of the United States as at least 18 per 1,000 and for the 91,500,000 persons in the United States in 1910, there would be 1,600,000 deaths per annum. Professor Fisher estimates that 42 per cent of this number or 672,000 are annually preventable, so that the annual waste from preventable deaths is 672,000 times $1,700(value of a 'dying' person in the United States)[3] or over $1,000,000,000.

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[1] Professor Irving Fisher, "Vital Statistics",p,536.

[2] This estimate is perhaps too high, the average income of workers approximating more nearly $600.00 or $650.00.

[3] Mr. Fisher calculated that the average value of a person now living in the United States is $2,900 (from Dr.Farr's estimates as to the value of an English Workman), and the average value of the lives now sacrificed by preventable deaths is $1,700. The latter average is smaller than the former, because

The total preventable loss from death and from preventable illness would thus make a loss to the efficiency of the country of $ 1,500,000,000 a year.[1]

These figures are to a great extent conjectures, says Irving Fisher, but give some idea of the great loss to material wealth through lack of conservation of national health. And this great loss continues, notwithstanding the fact that there exists the greatest movement in the world's history against disease in all its forms.

From the vitality statistics of the United States it is difficult to secure even approximate information as to the mortality due to the consumption of alcoholic liquors. Only a small per cent of deaths is due directly to what is termed "alcoholism"; the vast majority being due to some form of disease. Here oftentimes the investigations on the question of mortality have ended --- a certain per cent of deaths being attributed to different diseases and a certain per cent to alcoholism. Only within the last few years have the medical profession emphasized to the laymen that fundamental conclusions

the age of the dying is greater than the age of the living. Applying the $ 2,900 to our population of 91,500,00 we find that our population may be valued as assets at more than $ 265, 000,000,000.

1.Winthrop Talbot,M.D., Bulletin of the Efficiency Society, Feb.1913,p,4. "When it is considered that a conservative estimate places the avoidable loss from preventable disease in this country among industrial workers at over $ 200,000,000 annually, and that last year(1912) one industrial insurance company alone paid out in death benefits over $ 4,000,000 for deaths from tuberculosis--a preventable disease--it is indeed time for

on the question of mortality must be drawn from thorough analysis of first causes and not from subsidary symptoms as has often been the case.

"It has long been recognized clinically that persons addicted to the use of alcohol show less resistance in acute diseases and in operations accompanied by shock than more temperate individuals."[1] This has been confirmed by a number of experiments on animals and humans. Professor Taav Laitinen of the University of Helsingfors,Finland, gave to rabbits one cubic centimeter of pure alcohol per kilogram of body weight, which is equal to about four or five ounces of whiskey for a man per day. This was not sufficient alcohol to intoxicate the animal, but it was found that animals which had received this amount of alcohol for a considerable time had a much greater susceptibility to "pathogenic bacteria" and a greater mortality than in the control animals which had received no alcohol. Similar effects were observed "when toxins were injected instead of bacteria, and greater difficulty was encountered in rendering animals immune to the diptheria toxin if they had previously been treated with alcohol."[1]

Professor Laitinen also conducted extensive experiments on the disease resisting power of the human blood serum of drinker and non-drinker. From the examination of ninety four persons

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students of efficiency to give far more attention to the human element,especially to the removal of the causes of its avoidable waste through disease and illness, including minor disorders, ailments and depressed conditions, arising from lowered vitality."

[1] Professor A.R.Cushing,M.D., "Pharmacology and Therapeutics", p,143.

it was found that the resisting power of the human red corpuscles was lessened by the consumption of alcohol. The following table shows the results of his experiments on the relative bactericidal property of the blood serum of abstainers and drinkers.[1]

Number of hours bacteria contact with blood serum	1 hour	2 hours	3 hours	24 hours
Av. No. of bacteria colonies in nineteen drinkers -------	19,996.84	337.18	77.37	2.67
Av. No. of bacteria colonies in eleven non-drinkers -----	1,858.07	208.04	15.37	1.45

Professor Charles Stewart, of the American Medical Missionary College, showed that after taking two ounces of port wine, there was a fall in the opsonic index (the resisting power to disease) for the germs of tuberculosis of 37 per cent, and for those of pneumonia 42 per cent.[1]

The mortality tables of Osler and Mc Crae(1910) showed the following death rate from pneumonia.[1]

For total abstainers - - - - - - - - - - - -	18.5 %
For moderate drinkers - - - - - - - - - - - -	25.4 %
For intemperate drinkers - - - - - - - - - -	58.8 %

Dr. J.Herecourt of France in considering the cases of three men: an abstainer, an ordinary drinker and an alcoholic attacked by a disease, says that their chances of recovery lies

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[1] Anti-Saloon League Year Book, 1913.,p,260.

in direct proportion to the amount of alcohol taken, the abstainer recovering the most easily of the three.

The Committee of Fifty came to the conclusion that, "alcoholic liquors have no preventative effect with respect to infectious diseases, but on the contrary they appear to lessen the power of the organism to resist the cause of such diseases." They also attributed to the "moderate but continued use of alcoholic liquors", diseases of the liver, the kidneys, the heart, the blood-vessels and the nervous system in general.[1]

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[1] "Physiological Aspects of the Liquor Problem".

Chapter Four

ALCOHOL AND LENGTH OF LIFE

The average length of life in the United States is only half of what it might be. Men born in American cities of native white parents live on the average only 31 years.[1] In searching for the causes of such a low rate of life perhaps the most reliable information is obtainable from the reports of the insurance companies. Generally they have little sentiment and do business upon strictly business principles based upon experience. Their figures therefore may be relied on to a greater extent than others.

Insurance companies usually have three classifications of risks, which given in order of expectancy of life are: (a) Preferred risks, (b)Ordinary risks, (c)Doubtful risks. The moderate but habitual users of alcoholic liquors are included under the classification -- doubtful risks, while excessive users of alcoholic liquors will not be accepted as risks under any plan of insurance.[2]

The following Table (No.7) is from the United Kingdom Temperance Institution, founded 1840. The statistics contained in this table were embodied in a paper which was recently read before the Life Insurance Medical Officers' Association in the United Kingdom.[3]

1. W.B.Bailey, "Modern Social Conditions,"p.227.
2. W.F.Gephart, "Principles of Insurance," p.72.
3. "Alcohol Beverages and Longevity," Contemp. Vol.85,pp.413-429.

Table 7

MORTALITY EXCLUDING FIRST FIVE YEARS OF INSURANCE

Healthy Males --- Whole Life Policies --- 1846 - 1901

AGES	ABSTAINERS			NON-ABSTAINERS			Taking Non-Abstainers experience as 100, Abstainers experience is:-
	Exposed to Risk	Died	Rate Mortality % per annum	Exposed to Risk	Died	Rate Mortality % per annum	
0 - 24	4,512	22	.488	2,013	17	.845	57.8
25 - 29	12,138	66	.544	6,418	60	.935	58.2
30 - 34	25,756	118	.453	20,210	179	.886	51.7
35 - 39	37,153	178	.479	36,526	332	.909	52.7
40 - 44	43,061	250	.581	48,679	507	1.042	55.8
45 - 49	42,734	335	.784	53,489	750	1.402	55.9
50 - 54	38,728	412	1.064	51,426	902	1.754	60.7
55 - 59	32,234	542	1.682	43,918	1,065	2.425	69.4
60 - 64	24,002	617	2.571	33,390	1,128	3.378	76.1
65 - 69	16,049	684	4.262	22,475	1,148	5.108	83.4
70 - 74	9,234	578	6.260	12,607	914	7.250	86.4
75 - 79	4,317	503	11.652	5,745	611	10.635	109.5
80 - 84	1,324	203	15.327	1,880	307	16.334	93.7
85 - 89	322	66	20.497	356	78	21.910	93.6
90 - 94	55	14	24.455	49	16	32.653	78.0
95 - 99	5	---	------	1	1	100.00	
ALL AGES	291,624	4,588	-----	339,182	8,015	-------	

This table, based upon an analysis of seventy years, shows that the per cent of actual to expected deaths in the abstainers' class is 71.52, and in the general 94. These and other tables were submitted to an analysis by English actuaries, and the President of the English Institute of Actuaries says that there is little doubt that the abstainers, as a class, live longer than the non-abstainers.

Several life insurance companies give a bonus to abstainers and many more accident insurance companies give a reduction of premiums to total abstainers, varying from five to ten per cent. This reduction is based not only on the great immunity from accident enjoyed by that class, but on the more rapid recovery when stricken down by accident.[1]

Thus, from the consideration of insurance companies statistics both in Europe and America, it would appear that abstinence from the consumption of alcoholic liquors is one of many conditions which accompany a low rate of mortality, and that the consumption of alcoholic liquors is one of the many causes that accompany a high rate.

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1. William J. Graham, "Science and Human Life," World Today, Vol.15,pp.1115-1118.

"The old medicine and the old physiology, thought alcohol was necessary to health and efficiency. This traditional view had a curious illustration sixty years ago, when an English Quaker applying for a life insurance policy was charged a higher premium because he was a total abstainer."

Chapter Five

ATTITUDE OF MODERN BUSINESS

Thus it would appear from the preceeding chapters, that the moderate habitual drinker is at a disadvantage, in competeing for work, with the non-drinker. His efficiency, both mental and physical is impaired; he is a great deal more susceptable to disease germs and in the case of sickness is less likely to recover than the non-drinker; and finally, his 'expectancy' of life is shortened and premature death cuts into his productive period of life. The money loss to the nation, because of this lack of the conservation of the nation's health is hard to estimate accurately, but from the foregoing conclusions as to the effects of alcoholic liquors on the individual health, it must figure to a large extent in the $ 1,500,000,000 which Irving Fisher says is the price the nation pays for diseases which are preventable and for premature deaths.

Conservation of health is conservation of wealth. The two go hand in hand. Sickness is one of the great foes of the industrial manager. Health means efficiency--high rate of productive power; a diseased body means a low rate of efficiency -- or a low rate of productive power, and the difference between the two is a liability which the manager cannot afford to pass unrecognized. If the economic condition of the wage-earner is to be elevated, the conservation of his health, upon which his wage earning capacity depends, must obviously be a fundamental

consideration of great magnitude.

Fifty years ago the factory bell rang at ten in the morning to let the men out for a glass at the corner saloon.Now employers in modern corporations realize the mental and physical superiority of the total abstainer. A growing discrimination is being exercised against alcoholic liquor drinkers, until at the present time the largest corporations in this country will not employ a non-abstainer if an abstainer can be secured.

"Railroad managers are pooling their interests in respect to the drink question, so that these great corporations are gradually eliminating the drunkard and drinking man from the railway service."[1] It is a matter of dollars and cents with them and they cannot afford to have accidents. They have to compete with other roads.

Thus the American Railway Association covering 160,000 miles of the 202,492 main-track mileage of the United States, and employing 1,189,315 men, has adopted a set of standard rules, one of which is as follows:"The use of intoxicants by employees when on duty is prohibited. Their habitual use or frequenting of places where they are sold is sufficient cause for their removal"[2] The Michigan state law will not permit a man who is not

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1. Editorial, Harp W. Vol.46,p.27.
2. John Marshall Barker, "The Saloon Problem and Social Reform", p,11.

The following railroads have discriminated against the drinking man: Lake Shore and Michigan Southern, The Pullman Company, Chicago and Alton, Union Pacific, Wisconsin Railway Company, Pennsylvania Lines, Chicago Milwaukee and St.Paul,

a total abstainer to have anything to do with the running of trains. "The premium on temperance in railroad circles is so great that 25,000 employees of the Northwestern railroad signed a pledge of total abstinence at one time."[1]

Business houses likewise discriminate against drinkers of alcoholic liquors. The United States Commission of Labor sent out a note of inquiry to seven thousand concerns employing labor. Out of this number five thousand three hundred and sixty three responded that they took the drink question very much into account in hiring men, and that they had to be the more careful in selecting responsible men because the law held them liable for injuries caused by accident. The investigation further disclosed the fact that 90 % of the railways, 79 % of the manufacturers, 88 % of trades and 72 % of agriculturists discriminate against employees addicted to the beverage use of intoxicants.[2]

Thus it is becoming more and more evident that the abstainer has a great economic advantage over his fellow non-abstainer. That this economic advantage will continue to grow is shown by the 1910 Census Bulletin of Manufactures where it is seen that the proportional output of large establishments

New York Central and Hudson River, Boston and Albany, Chicago and Northwestern, Chicago,Burlington and Quincy, Illinois Central, Chicago,Rock Island and Pacific, Missouri,Kansas and Texas. Avery N.Beebe, "Enforced Sobriety", World Today,Vol.19,pp.1164-5.

[1] Ferdinand Cowle Inglehart, R of R's,Vol.39,pp.601-5.

[2] John Marshall Barker, "The Saloon Problem and Social Reform,"p.11.

is increasing, while that of small plants is decreasing. The efficiency of production in the large plant is much higher than in the smaller one: i.e., more product per man is turned out, and (what is of greater real importance) that a larger value per man is added to the product as a result of the manufacturing process.[1]

If then, large scale production is to become more and more a reality in our industrial organizations, the efficiency of the laborer must to a greater extent conform to the new standards.

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[1] Sidney Graves Koon, "The Efficiency of the Large Manufacturing Plant," Sci.Am. Vol.107,p.44.

Chapter Six

EFFICIENCY AND THE STANDARD OF LIVING

The efficiency or productive power of the individual, upon which all industrial organizations depend, is directly determined to a large extent by food and standard living.[1] The labor of the individual involves the expenditure of vital force, and unless this is replaced by wholesome nutrition (air, food, light and sanitation) the frame will work itself out and labor will become economically of smaller and smaller value. Above all then, the laborer should have good nutritious food and plenty of it, if he is to maintain himself at the "standard of efficiency".

Here the question arises; what are the 'necessaries' to maintain a laboring man. "The old use of the term 'necessaries'," says Marshall,[2] "was limited to those things which were sufficient to enable the laborer taken one with another, to support themselves and their families, In happier times, however, a more careful analysis has brought into prominence the distinction between 'necessaries for efficiency' and 'necessaries for existence', and has made it evident that there is for each rank of industry, at any time and place, a more or less clearly

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1. "The term the 'standard of life' is here taken to mean the standard of activities. Thus a rise in the standard of life implies an increase of intelligence and energy and self-respect; leading to more care and judgment in expenditures, and to an avoidance of food and drink that gratify the appetite but afford no strength, and of ways of living that are unwholesome physically and morally." Marshall,Principles of Economics,ed.5,p.689.
2. Principles of Economics, ed.5,p.120.

defined income which is necessary for merely sustaining its members, while there is another and larger income which is necessary for keeping it in full efficiency." This is clearly seen in some of our large American cities, where the low-priced, ill-efficient laborer exists and propagates his kind, but is not so efficient as the higher-paid labor in other districts.

"In England," says the same Economist,[1] "the necessaries for an efficient unskilled town laborer may be said to consist of a well-drained dwelling with some changes of underclothing, pure water, a plentiful supply of cereal food, with a moderate allowance of meat and milk and a little tea, etc., some education, some recreation and lastly freedom for his wife from work to enable her to perform properly her maternal and household duties." It would be needless to say that the American workingmen demand these necessaries to as great an extent as do the European. He goes on to say that, "if in any district unskilled labor is deprived of any of these things its efficiency will suffer in the same way that a horse that is not properly tended, or a steam engine that has an inadequate supply of coals. All consumption up to this limit is strictly productive consumption; any stinting of this consumption is not economical but wasteful."

In the United States (New York City) four hundred and

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1. Professor Marshall, Principles of Economics, ed.5,p.121.

eighty six dollars a year is considered by Mrs.L. B. More, to be the minimum income to supply necessaries for existence for a family of four and one-tenth, without receiving outside aid.[1] Other authorities place this minimum about the same for other parts of the country and for the United States as a whole. [2] This sum is not requisite by any means to maintain physical efficiency with the present cost of living, says Mrs. More, "for each one of these families (considered in her investigation) suffered moral and physical deterioration, and some of them are in a state of disintegration which must prove fatal to the family group unless conditions change and a larger and steadier income is possible in the immediate future." In this 'minimum standard' no allowance is made for anything but means of existence.

The minimum income to supply the 'necessaries for efficiency' in a family of four or five would at least be six hundred dollars, and in most cases a good deal more. This amount is barely large enough to provide for the 'bare' necessaries for the efficiency of the worker, so that if there is an expenditure for alcoholic liquors some other item in the family budget must suffer. The extent to which alcoholic liquors hold a place in wage earners budgets is brought out by several investigations on this subject.

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1. Mrs. L. B. More, "Wage Earners' Budgets", p.123.
2. Robert Coit Chapin, "Standard of Living in New York City", United States Department of Labor investigation into the "Cost of Living".(1903)
B. Seebohm Rowntree, "Poverty," Chap.4, pp.105-110.

Chapter Seven

ALCOHOLIC LIQUORS AND WAGE EARNERS BUDGETS

Mrs. L. B. More in an investigation of 200 Wage Earners Budgets in New York City, gives the proportion of the income that is expended on the necessaries of the household. The per cent of the income that is expended for alcoholic liquors is to be found under the general designation 'sundries'.

The following table (No.8) gives an analysis of the expenditures which constitute the group of expenditures termed sundries. The 200 families are grouped according to the proportion between their expenditures for sundries and the entire expenditure. In the first column there are listed 21 families, with small incomes, which spent less than 5 per cent of their total expenditure for sundries. Their average income was $507 and their average expenditure for sundries was $14.48. "Nothing appears for drink in this group because in six cases the husbands were sick, in nine families they were dead, had deserted or were in the penitentiary, and in three families in which it did not appear, the man was worthless and added nothing to the family income; only working occasionally in order to buy drink which therefore did not enter into the family expenses."

In column two, 40 families expended for sundries 5 to 10 per cent of their total expenditure. "Drink has become a regular item of expense in 13 out of the 40 families. In these families it was usually a pint of beer a day at supper, which

Table 8

DISTRIBUTION OF THE AMOUNT DEVOTED TO SUNDRIES [1]

Distribution	Per cent expended for sundries						Total Average per family
	-5	5-10	10-20	20-30	30-40	40-50	
	Average per Family						
Recreation -------	.74	3.63	9.34	17.72	13.85	397.25	13.17
Union -----------	.14	.30	1.62	2.20	2.38	0	1.37
Gifts or loans --	0	.83	3.39	12.73	8.91	122.50	6.18
DRINK -----------	0	10.45	18.80	35.65	36.00	88.40	20.76
Church ----------	0	1.39	4.49	6.11	2.79	11.20	3.72
Furniture -------	1.40	2.46	12.86	23.29	40.14	21.50	13.78
Papers ----------	2.60	3.00	5.68	6.18	5.54	6.50	4.93
Car-fares -------	.99	4.29	8.17	8.43	13.65	0	6.97
Medical attend. -	3.78	8.09	17.08	22.66	39.82	55.50	17.00
"Spending-Money"-	0	11.10	25.62	40.46	93.43	0	27.52
Education -------	0	1.60	3.10	7.85	23.43	0	4.83
Domestic services	0	0	.60	9.89	0	0	2.46
Funerals --------	0	0	.73	25.85	57.58	0	9.85
Miscelleanous ---	4.83	8.60	13.09	21.28	37.71	13.00	14.77
Total Sundries	14.48	55.74	124.30	240.30	375.23	697.85	147.31
No. of Families	21	40	79	45	13	2	200
Average income $-	507.00	748.	820.	1050.	1105.	1599.	851.
Av. Total expend.	510.00	747.	811.	998.	1103.	1599.	836.

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[1] Mrs. L. B. More, "Wage Earners Budgets", p.95.

costs $0.70 a week or $36.40 a year; but the average for the forty families in this group was only $10.15."

In column three, 79 families expended for sundries 10 to 20 per cent of their total expenditures. "A proportionately large number could spend money for drink --- 32 families, or 40 per cent of the number of this group. The average for all these families was $18.80, but 8 of them spent a large amount on drink. Over $52 a year, or a dollar a week for drink is considered a proportionately large amount for families of this average income."

The other groups may be compared in the same manner. It is a signifivant fact that the larger the income, the larger the expenditure on recreation and drink. The figures for the expenditure on drink are a little misleading in that this expenditure is merely what is taken out of the income for the general family use. The 'spending-money' and a large part of the 'recreation' expenditures are for drink and some per cent of the income is often spent for drink and never really enters the family budget at all. What per cent this amounts to, it is difficult to determine, says Mr. More.

From the data of Table 9, Mrs. More concludes that more native families in general had an expenditure for recreation and news papers, and more foreign families for drink, church and education. A false impression might be obtained as to the relative amounts of liquor used, if we do not take into consideration the fact that in the foreign families alcoholic drinks are

Table 9

ANALYSIS OF EXPENDITURES INCLUDED UNDER SUNDRIES [1]

ITEMS OF EXPENDITURE	No. of families	Av. am't for families having given expenditures	Av. am't for all families	% of total exp'd's for all families	% of total exp'd's for native families	% of total exp'd's for foreign families
		$	$			
Recreation -----	170	24.62	13.17	1.6	2.2	.9
Union ----------	46	5.93	1.37	.2	.2	.2
Gifts or loans -	39	31.66	6.18	.7	.7	.8
DRINK ----------	79	52.57	20.76	2.5	1.8	3.1
Church ---------	77	9.66	3.72	.4	.3	.6
Books and papers	154	6.40	4.93	.6	.7	.5
Furniture ------	94			1.6	1.7	1.6
Car-fares ------	74	18.84	6.97	.8	.8	.8
Medical attend.-	169	20.12	17.00	2.	2.	2.1
Spending-money -	108	50.96	27.52	3.3	3.6	2.9
Education ------	19	50.86	4.83	.6	.2	.9
Domestic service	10		2.46	.3	.3	.3
Funerals -------	17	115.82	9.85	1.2	.9	1.5
Miscelleanous --	164	18.01	14.77	1.8	1.8	1.8
Total sundries				17.6		

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1. Mrs. L. B. More, "Wage Earners Budgets,"p.103. (1907)

served at meals to a greater extent and would thus enter into the family budget, while the native American lists his trips to the saloon, oftentimes under the terms recreation or spending money.

In the column (for both native and foreign families) giving the average expended by families having each specified expenditure, it is seen that the highest averages were for funerals ($115.82), drink ($52.57), spending-money ($50.96), education ($50.86, etc.--- and recreation ($24.62). To the $52.57 spent for drink might be added at least one-third of the expenditure for 'spending-money' and 'recreation', i.e., $25.00, thus making a total expenditure for drink amounting to approximately $75.00 in this list of families.

The average amount spent in all families for drink is $20.76 or 2.5 per cent of their total expenditure. To this may be added 1.6 per cent (1-3 of 4.9 per cent, the combined per cent expenditure for 'spendiny-money' and 'recreation'), making a total of approximately 4 per cent of the total expenditures spent on drink.

This conclusion agrees with a thorough investigation of wage earners budgets in New York City by Professor Chapin.[1] His conclusions are given in the following table.(No.10)

[1] Robert Coit Chapin, "The Standard of Living in New York City", p.149.

Table 10

ALCOHOLIC DRINKS AWAY FROM HOME AND AT HOME

Average Annual Expenditure

and Number of Families Reporting --- By Income

INCOME	Total No. of Families	Total av. income	Average Expenditure for alcoholic drinks at home	Reporting Alcoholic Drinks at Home		Av. spent for Alcoholic Drinks, at home & away	
				No. of Fam.	Average Exp'd	Average am't	% of Av.Total Income
		$	$		$		
400 - 599 ---	25	503.03	14.13	20	17.67	18.47	2.7
600 - 699 ---	72	650.17	18.06	56	23.23	27.25	4.2
700 - 799 ---	79	748.83	20.93	58	28.51	32.52	4.4
800 - 899 ---	73	846.26	24.68	59	30.53	37.65	4.4
900 - 999 ---	63	942.03	22.91	46	31.38	36.56	3.9
1000 - 1099 -	31	1044.48	28.67	24	37.03	50.67	4.9
1100 - 1199 -	18	1137.42	39.63	14	50.95	59.96	5.2

Mrs. More says that the "influence of drink is one of the questions which statistics can only touch upon.[1] In this investigation only seventy nine families reported an expenditure for drink which amounted to from $.30 to $3.00 a week, but it was usually $.70 a week for a pint of beer daily for supper.[2]

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[1] "Wage Earners Budgets", p.140.

[2] There is no doubt that at least $.70 per week is spent by this class for alcoholic liquors, but in the large cities liquor is usually purchased to a large extent by the bucket and not by the pint.

The average expenditure for all families in the study was only part of the real situation. In addition, there were forty two families in which intemperance had affected the family standard, and in some of them the family was going to pieces because of it. --- The men who were the hardest drinkers did not bring home all of their wages, or only worked enough to buy liquor; so that this part of their earnings did not appear in the 'household income' and could not be estimated. The reason that more suffering is not shown as the result of intemperance in this study is because there frequently happened to be other members of the family whose earnings brought up the family income, and the man's earnings were not relied upon. Yet there were some extreme suffering due to intemperate husbands. The two poorest families having incomes of $250.00 and $260.00 a year were the result of this. It has been estimated that the average sum spent for drink by the families of the working classes of England is 6s. 10d., or about $1.70.[1] Undoubtedly, it was not nearly as high among these workingmen's families, but it must be remembered that an average of $20.76 a year or $0.40 a week does not represent the actual amount spent, but only that which came out of the family or house-hold income."

Thus it is apparent that expenditures for alcoholic liquors enter into the budgets of wage earners families, whose

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1. B. Seebohm Rowntree, "Poverty",p.142.

incomes would barely be large enough to supply 'necessaries for efficiency' if no expenditures were made for drink whatever. The fact that part of the income is spent for drink, means that some food, clothing and other necessaries must be abstained from. The 'necessaries for efficiency' now become merely the 'necessaries for existence'. The substitution of the latter for the former causes a loss of efficiency in the individual workman, which loss is sooner or later noticed by his employer, and the workman must drop down another rung in the industrial ladder at a lower rate of wage, or is forced to join the army of the unemployed.

Not only is the workman made economically useless because alcoholic liquor expenditures have ursurped the place of food and clothing expenditures, but, as has been shown(p.52) his efficiency is gradually being undermined through the direct effect of alcohol on the nervous system. A six per cent loss in efficiency due to the direct depressing effect of alcohol on the workman's mental and physical productive powers, together with at least a four per cent loss in efficiency due to lack of nutrition, is a handicap of ten per cent under which a workman cannot hope to compete with the non-drinker in the industrial world, to say nothing of raising his economic standard of life.

Chapter Eight

DEPENDENCE OF WAGES ON INDIVIDUAL EFFICIENCY

If the workingman's wages are to be raised, the question of efficiency cannot be overlooked. Says Marshall, "the only way of permantly raising the rate of wage is to increase the efficiency of the individual worker."[1] This can be done in two ways; directly and indirectly.

Indirectly it can be obtained by raising the laborer's estimate of his work and resultantly raising his estimate of himself. A rise in the standard of living would more than anything else cause the laborer to more highly estimate his value when he sells his labor to an employer. A rise in the standard of living involves an increase either in real or money wages. Besides the increase in money wages which would follow an increase in individual efficiency, an increase in the money wage of four per cent would be the result of excluding alcoholic liquors from the family budget.(page 73)

Directly, efficiency is obtained by an increased mental and physical ability to 'produce' on the part of the workman. From the resultant increased product the employer is enabled to give a larger share to the laborer, and while it is true that he does not always increase wages in proportion to increased efficiency, yet the general tendency of wages is to rise with increased efficiency. An increased efficiency by this direct

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1.Professor Marshall, "Principles of Economics", ed.5,pp.673-700.

method of 6 per cent would perhaps raise wages at least 4 per cent, which taken together with the 4 per cent raise through the indirect method makes an increase in the money wage of 8 per cent. This would be an increase of about $349,973,600 in the total wages and salaries of the United States to be distributed among the workers[1] The amount of increased wages due to efficiency, taken together with the estimated amount of money that is spent on alcoholic liquors by the people of the United States, would make the total increase in wages, to be spent on goods other than alcoholic liquors, approximately $2,000,000,000.

That the present lack of physical and mental efficiency exists, is due partly to lack of knowledge on the subject by the workingman, and partly to a widespread fallacy in regard to labor efficiency.

Considering the first cause, the laboring man oftentimes does not know the action of alcohol on human efficiency. Most of his information comes from custom and from the source that are pecuniarily interested in increasing the consumption of alcoholic liquors.[2] Thus beer is regarded by many thousands of workmen as being harmless, if not necessary like bread, and it would seem that before any great strides are made in increasing individual and national efficiency, a more widespread application of educative forces must be made use of.

[1] Total wages and salaries of the United States amount to $4,374,637,000. Abstract of thirteenth census, p.437.

[2] One form of presenting information, as to the desirability

Considering the second cause, the great majority of attempts to increase the laborer's efficiency has been opposed by the laborer, because of the belief that if one man could do the work of two, one of these men must be thrown out of work. As a result of this fallacy great opposition was brought to bear against the introduction of power machinery in the eighteenth century in England, while at present there is a wide-spread fallacy among workingmen that because machinery throws some men out of work, it is therefore detrimental to their interests.

These old fallacies are rapidly being exposed by reason of the recent studies in the efficiency of industrial work and in scientific management. "Improve the efficiency of the man on the machine, and immediately there is more work to be done, more money to pay for having it done, and higher wages for doing it."[1]

of alcoholic liquors, is by letters sent out by liquor firms to private individuals. The following letter is a reproduction of such a letter sent out by a brewing company, located at Danville, Ill.

> Dear Sir:
>
> The system needs rejuvenation, needs toning, nothing better than beer, no beer better than -----high grade.
>
> Many people do not realize the food value of beer. Do you? Do you know that beer nourishes, soothes, livens and cleanses the body as no other beverage does? Therefore the correct spring tonic, your Doctor will tell you so. Doctors generally prescribe Beer for both the sick and the well.
>
> Get the best, ------ HIGH GRADE, properly made, aged and bottled.
>
> For your convenience we enclose order card and return envelope. Use them now.
>
> Yours Respectfully,
> ------ BREWING CO.

[1] American Economic Review, March 1912, p.119.

Complete industrial success can come only to that industry which enjoys the cheapest materials, the most improved machinery and the most efficient labor.

Whether any industry reaches its maximum of efficiency, or not, is a matter of vital importance to every class in modern organized society. Every class is effected by the efficiency or inefficiency of any other class. If one class of industrial workers are efficient and another class are not efficient, the former class is injured to the extent of the inefficiency of the latter class which produces those things on which the former class spend their wages. For instance, if the shoemaking industry rejects an improvement by means of which its efficiency could have been increased 10 per cent, then it inflicts on the consumer who purchases shoes, an injury of 10 per cent of that part of his wages spent on shoes.

Thus the inefficiency of any class of industrial workers, reduces the real wages of the consumer who has to purchase his goods from the product which the worker turns out. It reduces the purchasing power of the individual and of the country at large and puts a heavy burden upon the more efficient producers.

Chapter Nine

THE RELATION OF THE CONSUMPTION OF ALCOHOLIC LIQUORS TO OUR ECONOMIC WELL-FARE

In order to secure an accurate knowledge of the effects on our economic well-fare of the annual huge expenditures for alcoholic liquors, it is necessary to make somewhat of an analysis of a few fundamental economic principles and laws. It is a striking fact in the realm of economics, that there exists a strong inter-dependence, a never failing correlation between the laws of production, consumption, supply, demand, etc. Like a delicate piece of mechanism no part can be isolated from the rest and considered in itself alone. For instance any stinting of the demand for the consumption of a good, results in a reduction of the production of that good; while any increase in individual productivity, not only causes wages to rise, but likewise tends to increase capital.

The inter-relationship of economic phenomena, as it has to do with the subject under discussion, may be expressed in the following manner: An increased demand for any commodity will result in an increased demand for capital, which will cause an increased demand for labor and hence an increase in the rate of wage. Ricardo reasoned backwards from this position, when he said, "When wages rise it is generally because the increase of capital and wealth have occasioned a new demand for labor which will infallibly be attended with an increased production of

commodities."[1]

A high rate of productive consumption is of great importance to the economic well-fare of the country.[2] Says J. A. Hobson,[3] "from the standpoint of the community, nothing else than a rise in the average standard of current consumption can stimulate industry. When it is clearly grasped that a demand for commodities is the only demand for the use of labor and capital --- the hope of the future of our industry is seen to rest largely upon the confident belief that the working classes will use their higher wages--- to raise their standard of life by the current satisfaction of all those wholesome desires of body and mind which lie latent under a 'low economy of wages'---. If there are theoretic economists who still hold that a demand for commodities is not a demand for labor,[4] they may be reminded that a paradox is not necessarily true ---. The growing opinion of economics students is veering round to register in theory the firm empirical judgment from which the business world has never swerved, that a high rate of consumption is the surest guarantee of progressive trade."

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[1] Ricardo, "Principles of Political Economy",p.57.

[2] 'Productive consumption' is only "such consumption by the productive workers as is necessary for their work", Professor A. Marshall, "Principles of Economics", ed.2,p.117.

[3] J. A. Hobson, "The Evolution of Modern Capitalism",pp.283-4.

[4] Says John Davidson, "A demand for commodities, in defiance of the classical economists is a demand for labor. An increase in the demand for commodities consumed by the working classes who form the great majority of the nation, would --- cause production to be conducted on a more economical basis." "Bargain Theory of Wages",pp.66-7.

Does there exist at the present time a high rate of productive consumption? If not, what forces are tending to lower this rate? According to the United States Census Reports for 1910 there is an estimated expenditure for alcoholic liquors of $1,800,000,000. To the extent that its use is not productive consumption, this sum is a direct withdrawal from productive enterprises, so that a low rate of productive consumption exists instead of a high rate.

The outlay for education, clothing, food, and housing cannot be made to such a great extent on average incomes, if an expenditure for alcoholic liquors is made. This is the more clearly seen from a study of the average rates of wage in the industries of the United States (Plate 9). The magnitude of this rate is not such that there exists a surplus for alcoholic liquors, after the necessaries of life have been provided for. If expenditure is made for alcoholic liquors, other expenditures cannot be made to such a large degree. If the individual demands a commodity which is not productive of efficiency, then the demand for productive commodities is lessened to the extent to which the demand for unproductive commodities exist. In other words one demand must displace the other. An expenditure of $1,800,000,000 for alcoholic liquors means that this expenditure has taken the place of $1,800,000,000 worth of expenditure for other commodities. What effect has this shifting of 'demands' on the general economic prosperity?

Defects in the economic situation has often been attributed to over-production. Generally speaking this has never been the case. The defect lies in under-consumption. "Over-production of two million pairs of boots is not over-production while ten million people remain unshod. What is needed is to stimulate consumption."[1] The man who is inefficient because of alcoholic liquor consumption, stops productive consumption to the extent of what he fails to earn and so cannot expend, and likewise to the extent of what he earns and wastefully expends, for all forms of expenditure have not the same economic value.[2]

This stoppage of productive consumption or lack of demand has a direct depressive effect on labor and capital. This fact is to be seen more clearly if we imagine the reverse of conditions to be true. Suppose that there is an increased demand for shoes. There must naturally follow an increase in the aggregate of capital in the shoe industry, in order to cope with this increased demand, and to carry on a larger amount of business. But capital alone cannot make shoes --- it must have labor to handle its machinery. Therefore a new demand for laborers occur

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1. Rowntree and Sherwell, "The Temperance Problem and Social Reform",Chap.1.
2. Report of the British Association(1882),p.304.
"It is erroneous to imagine that it does not matter how money is expended, whether productively or unproductively, provided it gives labor to the people, or provided the money expended remains at home; for while in the one case the object produced remains at home, and like capital becomes serviceable for further production, in the other case the object produced is either useless or utterly wasted. What is expended productively is never consumed.It reproduces itself again and again. What is expended unproductively is lost."

and under normal conditions, a new value is given for their services. In other words wages would rise.

Now what would be the condition of affairs in the United States if the production of alcoholic liquors was abolished? Immediate conflicting influences and disturbances of economic phenomena no doubt would occur, but looking at this suppositional case in a long-time theoretical way, the following economic readjustment would take place.

To begin with there would be a demand for commodities other than alcoholic liquors to the amount, it is estimated, of $1,800,000,000. This would cause an increase in the demand for capital, which under normal conditions could not be met. In the suppositional case before us, however, seven hundred and seventy one million dollars of capital, which is now (1910) invested in the combined liquor industries, would be liberated and go to neutralize this abnormal demand to a large degree. Not all of this capital would be available as some of it is in the form of capital goods, the value of which could not be easily transferred. Roughly estimated this untransferrible property would amount to about twenty per cent of the total or one hundred and forty millions of dollars. The other portion of the capital, i.e., six hundred and thirty one millions of dollars is in the form of buildings, land, cash,etc., most of which would be transferable to other industrial enterprises.[1]

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[1] Estimated from the distribution of capital in the brewery

This increase in the amount of capital for other industries would demand a large increase in the labor supply. Under normal conditions an increase in the demand for labor would cause wages to rise, but in the suppositional case, two hundred and fifty six thousand men, women and children would enter into the competitive field to supply this demand, so that the fluctuations of wages caused by the change could not be of great magnitude. If there occured any change it would be more favorable to an upward trend of wages, because the same amount of capital invested in the combined liquor industries, if invested in most of the other industries of the country would employ two to three times as many wage earners as is now employed in the liquor industries.(Plate 8 and page 29). The demand for labor would then be greater than the supply and a new value would be given to wages.

Of necessity such reasoning must be largely conjectures. There can be no doubt that the sudden abolition of the production of alcoholic liquors in the United States would derange the economic equilibrium now existing. Perhaps there would be a glut of grains on the market,(this would not be much, however, Table 3)

industry. "Text Book of True Temperance", United States Brewers Association, (1911) p.78. Quoted from the United States Twelfth Census Report, Vol.9, on Manufactures Part 3. Special Report of Selected Industries,p.600.

Land	13.01 %
Buildings	27.68 %
Machinery, tools, implements, etc.	18.31 %
Cash and Sundries (horses, vehicles, bottles,etc.)	40.00 %
Total Capital	100.00 %

an immediate surplus of labor or an abundance of unproductive capital, with lowered rates of interest. Some such phenomena must accompany all such changes in the units of any economic system, but in the long run, there is no denying the fact that capital and labor would eventually take their place under the new system and economic prosperity be again established. That this new prosperity would be greater, the facts seem to indicate, but in a situation where many forces are reacting and changes are constant, the difficulty of determining in advance what course the events will take, is too great and its results are too uncertain to warrant any premature conclusions.

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